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MINDED AND EPILEPTIC

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PRESIDENT'S ANNUAL ADDRESS

BY A. R. T. WYLIE, M. D., GRAFTON, N. D.

As a partial acknowledgment, at least, I wish to thank the association for the honor of the election to its presidency. Coming to me as it did, the association going outside its usual custom in electing me while holding a subordinate position, I feel it as much more of an honor. But the fates have decreed otherwise and the custom still holds good. For since the election I have gone to a new state and to a new work and am becoming accustomed to signing my name with the title, superintendent, attached.

Going into a new work at a busy time, soon followed by a legislature which changed nearly all the law governing the institution, I have been kept very busy and what little plans I had made for this occasion have been entirely spoiled. Being a youngster in the work, it seemed manifestly improper for me to attempt to instruct the older and wiser, in the work. I had planned, at least, to work up something for an address, as that seems to be the chief function of this office, but business has decreed otherwise and I am compelled in order to carry out the custom of a president's address to fill in with anything that comes to hand. What it might have been I can not say but will leave it to your imagination which I hope will deal kindly with it.

A new work in a new field probably emphasizes some features of our work which are existent everywhere. I had rather expected to find in a new state porportionally fewer mental defectives than in the older states, since one would naturally infer that the stronger and more capable people would emigrate and the stock consequently be sturdier. But observation, so far, leads me to think that the mental defectives are not porportionally fewer in number than they are in the middle western states with which I am familiar.

The chief need in our state is the education of its people both to use the institution and as to what feeble-mindedness means. The first can come only with the growth of the institution and the knowledge of it filtering out through the community through the years. The lack of knowledge on the part of the public as to what feeble-mindedness is and means and as to its effects, is the greatest hindrance to our work, and consequently, education concerning it is the greatest need at the present time. This lack of knowledge must in great part be laid at our own doors. The demands on our time of the boarding house keeper have inhibited and put aside this work. Then again our knowledge has been too general, this has lead to indefinite teaching and intangible results.

Now, it seems to me, is a particularly propitious time to push this work. The new classification based upon mental tests will give something definite and tangible and something readily understood by the non-professional mind. The Binet test should be a useful means to the end. But I do not think that it will do to tie too closely to it. It will give a means of determining the classes. But when so determined they should be defined in terms that the test uses and not in terms of the test itself, added to which are terms descriptive of the instinctive life and motor efficiency sufficient to identify the groupings. The test determines the intellectual efficiency but does not, it seems to me, include enough of the instinctive and motor capabilities for this purpose.

The pendulum has been swinging back again. Years ago the attempt was made to compare the feeble-minded mind with

that of the normal mind and to define it in terms of arrested development. The mental faculties and propensities were not all arrested at a certain stage of development but some at one period and others at another. The more fundamental and primitive will show forth more than the higher and later developed. Even the faculties and propensities which so far as we can see are of the same grade will be very irregularly developed in different cases.

So we always find the mixture of childishness and adult faculties and propensities which is so characteristic of the feeble-minded. One may have the mind of a child of eight years but the musculature and propensities of an adult.

The lack of judgment, or ability to adjust themselves to new circumstances, is the most important defect of our children and one not sufficiently appreciated by the public. Many amusing stories are known to all of us illustrating this. Living in an adapted and restricted and relatively fixed environment they soon learn its routine and consequently their deficiency does not show forth. Hence, parents and friends are deceived into thinking them more capable than they really are and we are importuned to dismiss them, thinking that since they do so well in an institution they will surely be able to get along outside. With our present lack of control, discharge is often necessary with results that are frequently disastrous. It is difficult to make people understand and appreciate these things. And I feel that we, at least, are partially at fault, for in our enthusiasm for our school work and its results, we must certainly over-impress—although not intentionally—the non-professional mind with the efficiency of our training of the arrested.

This leads us to the old question of heredity and environment in its pedagogical relations. Heredity, as our recent studies have shown, is a prime factor in our congenital cases. Can new environment or training modify the “salient mental and moral traits” as given us by a defective heredity? Dr. Woods, of the Massachusetts Institute of Technology, has recently been making some studies which are interesting in this connection. A study of some of the royal families of Europe showed such “variation in types of mind and character that even when narrowly

enviored in time and place a recourse to heredity was forced upon him,"—"for an explanation from environment would not work."

Studying the question in the light of experimental biology and the experiments in regeneration, he reaches the conclusion of a diminishing environmental influence which he expresses in the following generalizations of laws: Each organism, from conception through embryonic and post embryonic life, has an expected environment. Then modifications of the individual will diminish as determined by modifications of the environment (1) as the change from the expected are less and less in amount. This follows naturally as the effect is proportional to the cause. (2) It diminishes with increased phylogenetic rank. The lower in the scale, the greater the modifications, as, for example, some trees can be made to grow to ten or twenty times their usual size and the arms of some metazoa 200-300 times their usual length. In fishes, not much effect has as yet been determined, while in mammals, as guinea pigs, the rate of growth may be varied but the end result is the same. (3) It diminishes with the evolutionary rank of the tissue. In mammals, changes have been made in the skin and its appendages, and in bone, but not in the other tissues. (4) It diminishes with the age of the tissue affected. The embryonic tissues can be more greatly modified than the young or adult. The number of brain cells is determined long before birth and the brain practically reaches its full size at seven years. Accordingly, it is least affected by changes in its surroundings. And, finally, it diminishes in proportion to the power of choice which can be exercised by the individual in selecting his surroundings. Consequently, he concludes, the brain tissue of man is least affected by changes in the surroundings and mental and moral traits the least of all.

Galton studied twins, comparing thirty-five similar with twenty dissimilar and concluded that "nature prevailed over nurture" and he could find no difference in the mental traits studied in the difference in surroundings.

Woods' studies of royalty concluded that, "in spite of the facts that the environments show wide variations, these appear

to be negligible factors in the production of successful achievement or in the creation of virtuous or vicious types." "Successful achievement is almost entirely due to differences in germ-plasm. Fifteen out of sixteen who became distinguished were related to other distinguished persons."

Thorndyke studied the origin of mental differences in the New York school children. He studied six mental traits in fifty pairs of twins. The likenesses and differences found, he concluded, were due, "to at least nine-tenths of their amount to original nature." And he sums up his result by saying that, "such likenesses and differences in environment as act upon children in New York City who attend public school, are utterly inadequate to explain the differences and likenesses found in the traits measured."

Pearson and his pupils were unable to find that overcrowding, poverty, physically ill-conditioned or immoral parentage, are markedly detrimental to eyesight.

In conclusion, Woods thinks that, "all the evidence that we possess renders it highly improbable that any of the ordinary differences in human environment such as riches and poverty, good or bad home life, have more than a very slight effect in modifying this complex and highly organic function the improvement of which is the hope of the altruist and reformer." "There is not a grain of proof that ordinary environment can alter the salient mental and moral traits in any measurable degree from what they were predetermined to be through innate influences."

So much for Dr. Woods. However true this may be for normal children, it bears with special emphasis on our work. We are dealing with individuals who are less susceptible to changes in their surroundings than the average—unless it is the pathologic. All the studies that have been made show this: brain cells deficient in number and development, dulled senses, brain rigidity, defective memory, restricted mental fields, lack of judgment, lack of initiative and will power and living in the present. Consequently, modification of salient mental and moral traits during the life of the individual are less to be expected than with normal people. What does this mean to us? It enables

us to emphasize all the more important points of our work—a restricted environment adapted to their needs, eliminating the circumstances which are particularly liable to call forth the reactions we desire to control. It means a long circuiting of the same through other channels, as, e. g., the sex instinct through the mother instinct in the care of children. It means also perpetual segregation in order to carry out these measures and to exercise the control which society demands. It means that the mental and moral traits, once present, always remain, always ready to burst out at the call of the proper incentive unless controlled by long-circuiting or restricted surroundings. It means the placing of the pedagogical cure on the same plane with the pathological long ago laid aside.

Above all, it means that we are able to emphasize in teaching the public the permanence of the condition, the necessity for control and protection by the means of segregation and institutionization which have already been worked out, not only that we may enlarge our means to this end but that we may be able to continue the control through the life-time of the individual.



A CENSUS OF THE FEEBLE-MINDED IN INSTITUTIONS AND POORHOUSES

BY C. B. DAVENPORT, Ph. D., COLD SPRINGS HARBOR, N. Y.

A census is usually taken for statistical purposes. The totals of any class are important in relation to the total population to enable us to express the ratio of the class to that population. This ratio, in the case of feeble-minded, may serve various purposes; it may show us how many are to be subtracted from the total population of effective people—available, for example, for military service; it may show us what proportion of the feeble-minded is segregated and kept from reproducing its kind; it may serve as a base from which to measure the changes, if any, in the density of feeble-mindedness in the whole population, from decade to decade. All of these aims have a certain degree of utility and justify, perhaps, the expenditure necessary, to acquire the facts. We find the census volumes on feeble-minded in institutions—with their broad margins and extensive tables—are probably of use enough to justify the expense of publication.

The limitations in usefulness of the ordinary census are, unfortunately, too evident. The most obvious limitation is that the census reports give us no true insight into the actual proportion of the feeble-minded in the population but only those in schools for the feeble-minded. It is obvious that a complete and accurate census of all feeble-minded persons is at present impracticable. For we have not yet perfected our methods of detecting feeble-mindedness nor even reached a satisfactory agreement as to its definition. One clear improvement might, however, be readily made; namely, the inclusion in statistics of the feeble-minded of those who are cared for in county poorhouses. Certainly, a very large; if still unknown, proportion of paupers is likewise feeble-minded; and they are paupers because they are feeble-minded.

But the greatest limitation to the usefulness of the census returns of the feeble-minded lies in the fact that it is of far less

practical importance to learn, if it were possible, the proportion of feeble-minded for the state or country, than to learn in what family strains the defective germ plasm inheres and what are the principal loci where it is proliferated and the principal foci from which the feeble-minded arise. To get this information we need two basal facts about each feeble-minded person; first, the name of the family to which the person belongs and secondly, the place where he was born. The family name is not given by the father's surname only but by the mother's maiden name as well; and still better by the maiden name also of the two grandparents. For instance, I am not a Davenport, merely, but a Davenport-Benedict-Dimon-Joralemon. Such a compound name is more comprehensive and includes more links by which my traits may be connected with those of my kin. This quadruple name is about as extensive as the knowledge of most persons permits. Expanded beyond this point the multiple name also would become unwieldy.

The place of birth is of importance both for the more precise identification of the strain (e. g., the Massachusetts Davenports have had no common blood with those of Connecticut for eight generations) but also to lead to the discovery of breeding spots of the feeble-minded such as Guilder Hollow, the valleys of the Berkshires and those of the Ramapo Mountains. The discovery of these breeding spots is a necessary preliminary to their elimination.

For some years the National Bureau of Education has secured from the superintendents of institutions for feeble-minded, statistics as to the total number of defectives in their institutions and such statistics are published in the annual report of that bureau. The suggestion has been made that the bureau should obtain from institutions not only the total numbers, but also a list of inmates including (1) the family name, either in its double (father-mother) or quadruple (grandparental) form, and (2) the place and date of birth of each inmate so far as known. Such information would not be for publication but for consultation and study.

The only serious objection that the bureau sees to carrying

out this suggestion is that certain superintendents might feel that they must guard the privacy of their patients' identity. While the desire to protect the patient and his family from the distress and burden that empty-headed scandal mongers know how to inflict is a laudable one, still that danger can be largely, if not wholly, avoided by the privacy of written records in a central office at Washington. On the other hand, it cannot be admitted that feeble-mindedness is a personal and private matter. There is reason for believing that it is one of the oldest traits of mankind—a heritage from his ape-like ancestry. The feeble-mindedness of to-day is (for the most part) the dower of a germ plasm common to hundreds of thousands of kin living and past; and if not controlled, that germ plasm may pass into hundreds of thousands of descendants. How can the product of a germ plasm with such a history regard his traits as purely personal and private? In a large sense, his germ plasm is a matter of national concern—its source and its possible fate are matters of public interest and concern.

This paper is written to awaken an interest and secure the co-operation of superintendents of institutions in the proposed list and census of the feeble-minded, to the end that it may be made as complete and useful as possible.



DISTURBANCE OF THYROID FUNCTION

BY J. IRWIN ZERBE, M. D., FRANKLIN, PA.

Although the heading of this paper is "Disturbance of Thyroid Function," it will be necessary for us to consider, in the brief space of time permitted, a number of the other glands that elaborate an internal secretion. Modern investigation has brought out the fact that while the glands secrete and pour out into the circulation products that perform a definite function in the metabolism of the body, they also, through the secretions, exert just as definitely an influence upon the activity of each other, and indirectly, upon the physio-chemical changes in the organism. The thyroid secretion has been given more attention by research workers, and is better known in its action, relations and therapy than perhaps any of the other internal secretions, and for this reason the subject of the paper as stated was chosen.

The object of the paper is to show the relation, then, existing among the products of thyroid, thymus and adrenal activity, their influence upon metabolism, the part they play in the etiology of certain types of idiocy, and the possibility of their being a factor in the etiology of feeble-mindedness in general.

FUNCTIONS OF THYROID—In times gone by, various theories have been advanced as to the functions of thyroid. We will mention three that have been, perhaps, the beginning of present knowledge of the purpose of this gland:

Bouchard—It would appear that the thyroid, through glandular activity, destroys substances that would induce edema, low temperature, and debility. That excess of its secretion would hasten the processes of metabolism.

Blum—Believed that the function of the gland was to render harmless certain toxic products of intestinal activity, which products he was pleased to call entero-toxins.

Chittenden—that the thyroid was a regulator of carbo-hydrate metabolism.

Robert Hutchinson, in the *British Medical Journal*, (1898), in regard to thyroid function, makes the following statement: "Briefly, then, it may be said that the effect of the administration of thyroid is to increase oxidation in the body; it makes the tissues, as it were, more inflammable so that they burn away more rapidly. The products of disintegration of nitrogenous tissues appear in the urine, almost entirely in the form of urea, uric acid, the xanthin bases being neither regularly nor appreciably increased, while the products of fat destruction are eliminated as CO_2 by the lungs, and water by the kidneys." Thyroid-ectomized carnivora show a train of symptoms characterized by tremors, muscular twitchings, at times, tetanic convulsions accompanied by irregularity of voluntary movements. Finally, a symptom-complex, indicative of disordered nutrition ensues, followed by death. As pointed out by Cunningham, these symptoms are identical with the symptoms of insufficiency of adrenal function, and are not to be ascribed to the absence of a thyroid derivative, *per se*. The experiments of Munk follow out and strengthen this view. While he showed that not all thyroid-ectomized dogs developed the syndrome mentioned above, and died of cachexia—which to the superficial observer would mean that the thyroid was not necessary to life—he pointed out that in the animals that survived, the adrenals were adequate to meet the extra calls upon their functions without stimulus from thyroid. In those that died, (the majority) the adrenals yielded to the accumulated waste products owing to adrenal inadequacy engendered. This makes it obvious that administration of thyroid extractives should so stimulate the adrenals as to enable them through over-activity to increase the oxidizing substance in the blood serum and destroy the toxic waste products produced.

The theory that the thyroid exerts a direct action *in situ*, on the toxins circulating in the blood is disproved by the research of Christioni. He shows this to be untrue, because, in the first place, extracts of the glands are active in promoting growth, metabolism, and mental power; and, second, he has been able to transplant the gland into other parts of the body and there carry out its functions. Bauman and Goldman point out that the active

extractive of the thyroid is iodothyrim. Thyroid-ectomized dogs did not show tetanic convulsions as long as iodothyrim was administered, but the convulsions again returned when the iodothyrim was discontinued.

It may then be assumed that the secretion enters the blood and enhances metabolic processes and oxidation. It is not in itself endowed with properties that enable it to carry out the processes directly, but probably supplies the blood with some agency which directly or indirectly stimulates the adrenals.

FUNCTIONS OF ADRENALS—The secretion of the adrenals brings about physiologic phenomena that are not awakened by extracts of any other organs. Adrenal extract raises blood pressure and slows the heart, the rise in blood pressure being brought about by the action of the extract directly upon the heart muscle. In fact, adrenal extract exerts a direct action on all muscle tissue. The muscle in the blood vessels contracts under its influence even after section of the spinal cord. It oxidizes products of catabolism. This is pointed out in an ingenious experiment upon frogs. Summer frogs died in forty-eight hours after the adrenals were removed, while winter frogs, in which the metabolic processes were sluggish and at a low ebb and far less toxins were produced, lived sometimes as long as twelve days.

Adrenal extract is a vital factor in the interchange of oxygen and CO_2 in the lungs. The secretion can be traced in the blood to the lungs but not beyond them.

EFFECT OF CERTAIN POISONS ON THE ADRENALS—It has been shown that certain poisons, notably essence of cloves, Friedlander's bacillus, diphtheria toxin (by mouth), produce acute congestion of the adrenals. The functions of these glands are thus enhanced until a condition of over-stimulation is produced. The symptoms noted, then, are those of adrenal insufficiency. That is to say: we find extreme weakness and decline of muscular power, abdominal pain, great reduction of blood pressure, sub-normal temperature, liquid stools, scanty urine, syncope and convulsions. Noe is the author of the statement that all disturbance under the head of toxemia has a pernicious effect upon the adrenals and in greater or lesser degree

brings about the train of symptoms noted above. The relationship of the thyroid and adrenals shows itself more clearly when we transfer our analysis to diseases that are ascribed to excessive or insufficient or absent thyroid secretion. Exophthalmic goitre is the type of excessive secretion and myxedema and cretinism are types of insufficient secretion. Let us first, then, analyze exophthalmic goitre.

EXOPHTHALMIC GOITRE—The symptoms in this disease are ascribed, as we shall see, not so much to the immediate excess of thyroid secretion, as to an abnormal direct or indirect stimulation of the adrenals, produced by a corresponding excess of thyroid secretion. Two stages are usually noted in this disease: (1) Erethic stage corresponding to adrenal over-activity. Some cases do not go beyond this stage; they are either cured or go to a fatal issue because of myo-cardial changes. (2) Asthenic stage due to, and showing the syndrome of adrenal insufficiency.

The stage of over activity is characterized by (1) cerebral hyperoxidation as shown by headache, excitability, irritability, capriciousness, unnatural gayety, and at times hallucinations, mania and convulsions. (2) Unusual muscular activity and consequent muscular fatigue are due to excessive oxidation, reduced chest expansion and general emaciation. (3) Contraction of central and other muscular vessels, and centrifugal dilation of the capillaries. This is shown in the brain by the symptoms in the brain just mentioned, and peripherally by cutaneous flushings and superficial heat, urticaria, erythema, purpura, localized and general edema. It shows itself in the respiratory organs by dyspnea, dry cough, epistaxis and hemoptysis. In the alimentary tract by salivation, vomiting, thirst, and capricious and often voracious appetite to compensate for the excessive oxidation; in the visual apparatus, by exophthalmos, flashes, sensations of pressure and brow ache. (4) Increased cardiac stimulation shown by its rapid and violent action and cramped heart. (5) Exaggerated tendon reflexes due to excessive muscular and spinal oxidation.

The stage of insufficiency when present presents the following features: (1) Cerebral sub-oxidation and sub-nutrition as

shown by mental impotence, low spiritedness and melancholia. (2) By reduced muscular metabolism. (3) By dilation of central vessels and other muscular vessels and passive contraction of the capillaries, causing diarrhea, persistent vomiting, glycosuria, albuminuria and excess of urea.

MYXEDEMA AND CRETINISM—As mentioned before, the removal of the thyroid gives rise in the fatal cases to a characteristic train of symptoms. The animal is dull and apathetic, muscular in-coordination and shivers precede spastic paralysis. The temperature falls rapidly. As shown by Albertoni and Tizzoni, the blood shows less power to fix oxygen. Masoin has shown that the relative quantity of oxyhemoglobin is diminished in proportion as the morbid results of thyroidectomy progressed. We can assume, then, that the marked emaciation is due to impaired nutrition which impaired oxidation involves; that its tetanic convulsions point to imperfect oxidation of waste products and the insufficiency of the adrenals, due to reduced thyroidal activity, underlies all the morbid phenomena that follow thyroidectomy.

Imperfect, inadequate or arrested thyroid secretion can cause myxedema. In all cases the glandular elements of the thyroid have been found to be markedly compromised. Adami found the specific cells replaced by fibrous tissue in most cases collected. In cretinism, either the thyroid is totally absent, or there is more or less deficiency of glandular elements, or excess of connective tissue with cellular debris.

If thyroidectomy can so inhibit the adrenal function, to so materially interfere with oxidative processes as to cause death, such marked structural changes as these produce great functional disorders also ascribable to impaired oxidation. The symptomology of cretinism upholds this view.

The temperature is always subnormal and cretins are prone to suffer from cold. The nutrition of the tissues is impaired, the brain is undeveloped, and the fontanelles often remain patent. The skin is dry and thickened, the hair thin and coarse or absent, the nails short, brittle and striated. Growth is very slow and arrested at an early stage, ossification is tardy, the epiphyses

appearing late. The muscular system is weak, the head tending to drop forward, but no epileptoid movements occur. Magnus Levy in four cases studied, found a diminution of oxygen, and formation of CO_2 , whereas in Graves' disease, the opposite has often been proved. G. N. Crary shows that after thyroid extract is given, increased metabolism is shown by elevation of temperature, increased appetite and more complete absorption of nitrogen, loss of weight, growth of the skeleton in the young and generally improved body nutrition. Every abnormal condition present, including mental torpor seem to gradually recede and the increase in oxidation often brings about a change truly phenomenal.

Myxedema in the adult, shows a picture varying somewhat from that of cretinism. The morbid processes are the result of retrograde changes in normal tissues. In infantile myxedema, the cellular structures have never been brought to a normal nutritional standard. The principal difference is in superficial swelling, the result of perverted cutaneous and sub-cutaneous functions, which functions have not been fairly developed in the cretin. The patient is capable of bursts of strength as shown by Charcot, showing that vital functions are only in abeyance and that we are not dealing with structural changes. Muscular exhaustion shows itself in the inability of the patient to stand normally, quivering of weakness, the ataxic gait observed at times and the oft noted fibrillary tremor. Tissue metabolism is markedly reduced as shown by the decrease of urea and uric acid in the urine. Under thyroid extract, the tumefaction disappears, sensibility returns, proving that nervous and cutaneous structures are not structurally impaired, but merely inactive because their "pabulum vitae" is lacking. All the symptoms enumerated at times disappear, evidence that the result is obtained through enhanced oxidation in all parts of the organism and procured through the suprarenal activity induced.

THE THYMUS—The study of the thymus raises a problem that, when finally worked out, may have an important bearing upon the study of the feeble-minded. That its secretion has a function in the inter-action of internal secretions along with the

adrenals, thyroid and pituitary body is more than probable, and that there is sufficient ground to consider it in the etiology of weak-mindedness is brought out by the researches of Katz, Bourneville and Cabot. The Thymus is active during intrauterine life, beginning before the fourth month and remains active, less and less, until at the time of puberty. It is believed that it functionates as a bone-forming organ, and also that it forms the first leukocytes in the organism. Kalliker and later Prenaut and Oscar Schulze have held this view. After birth, the largest source of leukocytes is in the bone marrow, and it is reasonable, as pointed out by the authorities cited, that the organ that was active in bone formation, would also be active in leukocytogenesis until the bone marrow could take up its function.

J. Beard, in studying this problem in the smooth skate, found that the first leukocytes were formed from the epithelium of the thymus gland. It is rich in phosphorus, which is in keeping with the high phosphorus content of both bone and leukocytes and as pointed out by Sajous this raises the question as to whether it is not as active in forming nervous as well as osseous tissue. His stand is strengthened by the fact that the leukocytes are the earliest carriers of nourishment to the brain.

Extract of foetal thymus, same as extract of foetal thyroid is inert. That extract of thymus is capable of stimulating the adrenals in the same manner, though in lesser degree, has been brought out by Ott and Owen. Ott found that powdered thymus increased the pulse rate, and that there was at first a rise in blood pressure followed by a fall, also respiration was increased and a slight rise in temperature produced. Owen found that thymus extract caused an improvement in the same class of cases of exophthalmic goitre (second stage) as thyroid extract. Abelois and Billard show that the thymus gland supplies some substances which directly or indirectly stimulate the secretory function of the adrenals and thereby enhances the activity of the oxidative processes. Katz, of Paris, at the request of Bourneville performed autopsies upon sixty-one children ranging in age from one month to thirteen years, and found the thymus present in sixty-one. Bourneville, himself, in twenty-eight autopsies upon

mentally weak and epileptic children found the thymus absent in twenty-five. In a later series of two hundred and ninety-two cases, it was absent in seventy-four per cent. Bearing in mind these figures, let us consider an observation made by Cabot. Because of the fact that thyroid extract benefited myxedematous children and cretins, he administered it to dwarfed children not myxedematous. Three cases were idiots, and in the other seven the faulty development was mainly physical. In all the ten cases there was considerable increase in height, but the mental condition was not improved. This is in marked contrast to the mental improvement in cretins under thyroid treatment, and is significant when we remember the fact noted by Marie, that in cretins, the thymus gland is present. We may conclude, then, that if the majority of mentally weak children do not possess thymus glands, and thyroid extract will enhance growth of idiotic children, not myxedematous, the oxidation processes stimulated by the thyroid through the adrenals, are not sufficient to bring about an improvement in the mental condition. The mental development evidently, then depends upon the thymus through an element the thyroid does not contain.

All of us who have worked among the feeble-minded will, perhaps, have noted the generally feeble circulation, low blood pressure, absence of so-called "nervous temperatures" and high reactionary temperatures, after major surgical procedures, the lessened resistance to bacterial invasion and to bacterial toxins, and the stunted or faulty physical development. What are these symptoms but symptoms of faulty oxidation, and faulty oxidation means a fault somewhere in the thymus-thyroid-adrenal triad. The autopsy room has not yet explained these symptoms, nor have they been satisfactorily explained by the disturbances of eye-sight and hearing, Hutchinson's teeth, adenoids and meningeal adhesions. Is there enough evidence in these pages to justify a study along these lines of the material in our institutions? That is, studies of blood pressure, temperature changes in health and disease, oxidation, physical growth, presence or absence of thymus glands and experimental administration of thymus and thyroid extract? If such investigation will be stimulated, the purpose of this paper has been accomplished.

SOME PRACTICAL PROBLEMS RELATING TO THE FEEBLE-MINDED*

BY THEODORE DILLER, M. D., CLINICAL PROFESSOR OF NEUROLOGY, UNIVERSITY OF PITTSBURG

In his excellent work on mental deficiency, Tredgold proposes that the word "amentia" shall be used as a general term to include all grades of mental deficiency. While I can see objections to the use of this word, since it is used in another sense to describe a certain group of insanity, yet the word is convenient, and I shall use it in this little paper in the sense in which it has been proposed by Tredgold.

Investigations, official and semi-official, show that there are in England and Wales, with a population of 34,349,435 persons (1906), 138,529 aments. This means that there is one ament for every 248 in population, the aments being a little more numerous than the insane. The number of persons suffering from all forms of mental disease including amentia and insanity, in England and Wales, is 264,356, or one in every 130 of the population. And now, if the same relative proportion of aments is to be found in Pennsylvania as is found in England and Wales, it would be fair to estimate that we have something like 35,000 aments in this state—a truly appalling number. And it is all the more appalling when we consider that only a comparatively small percentage of this number is confined in proper institutions. While there are many comparatively harmless aments, there are many who are more or less dangerous and the community and state run many risks by reason of their presence among them. The state and society must bear a great burden by reason of the unchecked propagation of imbeciles by imbeciles.

*A paper read at Polk, Pa., June, 1911, before the American Association for the Study of the Feeble-Minded.

As to the causation of amentia, I suppose there is very general agreement that the most important single factor is that of heredity. This factor, I myself believe to be so great as to dwarf all others into comparative, or relative insignificance. This leads me at once to one of the main points which I wish to make in this little address, which is to raise the question once more as to what can be done or what we should strive to do to prevent or lessen the effects of heredity in the production of amentia. One remedy which at once presents itself is education. In the fight against tuberculosis and the spread of social disease the value of education is urged and it is believed to be a very important aid in combating the spread of these diseases. So, too, we might hope that education will have some effect in preventing procreation among imbeciles. Yet we cannot hope it will have this effect by operating upon the imbecile mind. This would be an unreasonable hope. But we may hope that education of the profession and of the public generally may have the effect of preventing imbeciles begetting their kind. In two ways imbeciles may be prevented from begetting their offsprings: (1) By sterilization; (2) by sequestration or enforced residence in public institutions such as this. A bill providing for the sterilization of aments passed the legislature of this state a few years ago, but was vetoed by Governor Pennypacker who had fears of the consequences of the act. A new sterilization bill was passed by the lower house of the state legislature this last spring, but it was killed in the senate. I am informed that Governor Tener favored the bill and would have signed it had it come before him. Already in a few states—Connecticut, Indiana, and California, and one or two others—sterilization of certain aments is sanctioned by law. So it would appear that this movement for the sterilization of certain feeble-minded persons is growing, and I suppose it would be looked upon with favor by your association.

Dr. Joseph Neff, director of the department of public charities of Philadelphia, has recently investigated the subject of feeble-mindedness in Pennsylvania and finds there are 15,000 feeble-minded persons in this state and that of these there are a considerable number of feeble-minded women of the child-bear-

ing age. All these women, or nearly all of them, are brought in sexual contact, as is well known, and their offspring is considerable. The very obvious consideration comes up, why, even from an economic point of view alone, should the state permit such a loop-hole of almost certain propagation of such numbers of defective children who are certain to be a burden and expense to her? And then, when we consider the infinitely higher reason, namely, that of the quality of her citizens, why should the state permit the propagation of aments when to a considerable extent she has it in her hands to prevent it?

Personally, I thoroughly favor a bill providing for sterilization of certain of the feeble-minded. I believe such a bill should be wisely drawn; and I believe that too much should not be attempted at first. I would favor the sterilization of only the more obvious cases so that the public sentiment would go along with us in the matter. I believe that it would be well for your association to discuss this subject, if it has not already done so, and prepare a bill which seems to it best adapted for this end. It is of great importance that this bill for the sterilization of aments should be wisely drawn by whomsoever it may be devised.

As to the other means of preventing the propagation of aments, viz., by sequestration in public institutions, this would not be so effective as sterilization and yet it would have much controlling value too; and, indeed, if the law compelled feeble-minded who might propagate their kind to remain in proper institutions for feeble-minded and their relations were denied the right to remove them as they see fit, sterilization might not be needed. This brings up the more general question of the control of aments by the state apart from the question of sterilization. I believe we should have some law by which aments who might in any way endanger the community, either by propagating their kind or be committing assault, arson or other crimes would be forced, after a proper procedure, to go to a state hospital for aments. The matter of discharge of such patients should be in the discretion of the superintendent of such institution under the supervision of the state board of lunacy. If

this were so, these institutions could save the community and the state by refusing to discharge persons who might endanger the welfare of society. To allow the admission and discharge of aments to proper state institutions to be in the hands of the parents of such persons is foolish. Such regulations as I would advocate, and which I understand have often been discussed in your society, I feel can only be accomplished after some agitation of the subject, since it seems to interfere with the personal liberty of which by heredity we have always been jealous. But I believe the matter should be pressed and that a regular campaign of education should be undertaken until the thing is accomplished.

But before either sterilization or sequestration are commanded by the law we should have an accurate census of all the feeble-minded in the state (this implies to any state). With a little time and patience such a census could be made. Not only should we have a census, but all the feeble-minded in the state whether in or out of institutions should be under the supervision of the state board of lunacy. This board should be empowered to decide in any case as to whether an ament should be in an institution or should be allowed to remain at home. To do all this the state committee on lunacy would require proper agents and inspectors. But if the thing were undertaken in a proper way, we could within a reasonable time have a reasonably accurate census of the aments in the state and have them under proper supervision and control as I have indicated. So, I believe that a wisely drawn law requiring that the census of all aments in the state should be made and they be placed under control of the state board of lunacy and requiring sterilization of such of them as might propagate their kind and requiring the lunacy committee to sequester in proper state institutions all aments who might be capable of propagating their kind or whose presence in the community would endanger its safety.

And yet, even if we took such steps, would we not still be far behind what obtains in the world of domestic animals? I have visited this excellent institution a number of times and the enormous contrast between the defective children and the

superbly developed animals, all of whose ancestors have been so carefully selected always impresses me. No object lesson, no argument could better enforce what I have attempted to present to you.

I have argued now for a well considered law providing for sterilization of certain aments; and for another law by which aments who should be in institutions may be taken there by the power of the state and kept there by the same authority so long as it shall be best for their own good and that of the public. Now I shall go one step farther and speak more generally of the matter of the propagation of the human race. It has been pointed out over and over again until the comparison is trite that we exercise great care in the propagation of animals and plants and little or none in the propagation of the human species. Indeed, there is a very widespread notion that the marriage between two persons is a matter of their affair and their affair only and that the next door neighbor should not in any way meddle in the matter. I believe none of us here would subscribe to this doctrine. We have a right not only to take an interest in the subject of marriage, but I believe it is our duty to do so. Already, in some states, laws have been made making certain requirements of those who propose to get married and it seems likely that this movement will spread, for there appears to be a pretty widespread feeling among the public generally that it is unwise to permit marriage without any restraint whatsoever, as to health. Here again, we need a campaign of education, for no law can be enacted along this line for which the public is unprepared or uneducated. Personally, I believe that the beginning would be best made by drawing up a law with the minimum requirements as regards health, ancestry, etc., for applicants for marriage. Such a law should be most carefully drawn. After it were shown that it is workable, it could be easily strengthened and made to include more so that finally we might hope that the state would have something like an adequate protection against the propagation of the unfit.

And finally, in closing, gentlemen, I make no apology for

having spoken to you on a subject which is old and which has been discussed on previous occasions. While this subject may be old it is new while it is still unsettled and so much remains to be done regarding it. I believe it is more and more the duty of physicians to address themselves to the prevention of disease. And for those of us whose special work leads us to deal with the mentally deficient we can hope for nothing by way of prevention so much as by cutting off or minimizing the terrible effects of the terrible law of heredity.



BOOK REVIEWS

FEEBLE-MINDEDNESS IN CHILDREN OF SCHOOL AGE—C. Paget Lapage, with an appendix by Mary Dendy, Manchester; at the University Press, 1911. Pp. 1-359.

This book is written for school medical officers, teachers and social workers who have to deal with the feeble-minded. Its object is stated as threefold. (1) To emphasize the importance of the subject of feeble-mindedness for the welfare of the community. (2) To point out that feeble-mindedness is inherited. (3) To show that the only effective way of dealing with the problem is to provide suitable, lifelong care for the feeble-minded. The history of the movement in England to provide for them is briefly sketched. There are at present three chief agencies. (1) The Lunacy Commissioners and Idiot Asylums. Under the Idiot Act an idiot or imbecile who is under age may be placed by his parents or guardian in any hospital, institution or licensed house registered under this act. The idiot asylum can at present accommodate about seven per cent. of this grade of cases, which excludes morons. There are large waiting lists, and cases must be discharged after a term of four to seven years to make room for others. (2) The Poor Law Guardians. The Guardians can deal with idiot paupers, adopt them for life and send them to workhouses or asylums with the consent of the Local Government Board. (3) The Education Authorities. These, with the consent of the parents are empowered but not required to provide for mentally defective children under the age of sixteen. In 1904 a Royal Commission on the care and control of the feeble-minded was appointed, which made the following recommendations in 1908: (1) The establishment of a Central Board of Control. (2) The registration of all mentally defective persons at the office of this board. (3) The appointment of local committees to arrange for the suitable care of defectives on the request from parents or guardians. (4) The regis-

tration and supervision of suitable houses and private homes for defectives. (5) The provision of trained visitors to exercise a supervision over all registered defectives not in colonies or other institutions. (6) The registration and classification of cases under some definite plan.

After this introductory chapter the author deals with the topics usually discussed in books on this subject, in a brief but concise manner. These are: Physical Characteristics, Mental Characteristics, Speech Defects, Special Types, (Mongols, Cretins, etc.), Diagnosis, Prognosis, Treatment and Care, (medical only), The Cell, Reproduction and Heredity, The Conditions of the Brain, Causation, Inherited Factors, Causation, Acquired Factors, Preventative Measures and General Considerations, and an appendix by Mary Dendy on treatment and training, examination of the head and of speech. Some special features of the book may be noted. He observes that the chief causes of speech defects are defects of attention, will, a mental laziness, and of memory. The babbling of normal infants, important for speech development, is often absent in the feeble-minded. The most striking defect is the substitution of one consonant for another, or "lalling." Following Wyllie's classification of the consonants into the "physiological alphabet," he gives percentages of frequency of defect for the different consonants. In the chapter on diagnosis of feeble-mindedness and its different degrees, a more or less definite procedure is outlined, but it does not incorporate any of the newer and more elaborate methods. The discussion on the condition of the brain, and on causation should prove particularly helpful to the general reader. Dividing the causes first into the inherited and the acquired, and defining the inherited as all those that affect the germ plasm before conception, he holds that ninety per cent. of the cases of feeble-mindedness are due to the inherited. The mechanism of these in producing the defects of the brain tissues is explained as a lack of an innate power of the nerve cell to develop, without the intervention of any intermediate processes. In other words, in ninety per cent. of the cases we are dealing with an hereditary arrest, pure and simple. The reasons for this position are sum-

marized under five headings which cannot be reproduced here. To the reviewer they are not entirely convincing. The author's object stated at the outset is more fully discussed and justified in the chapter on preventative measures and general considerations, in which the main recommendations of the Royal Commission are endorsed. To guard society against the feeble-minded and the consequence of their existence at large, lifelong care is essential. For the benefit of the feeble-minded themselves an early diagnosis and commitment is especially desirable. The appendix by Mary Dendy gives a very concrete and quite detailed description on the management of the feeble-minded in an institution.

The book is well written and admirably fulfills its purpose. It should do much towards arousing a fuller appreciation of the importance of the problems incident to the existence of the feeble-minded. It should, and doubtless will find a much wider circle of readers than that to which it is addressed.

F. Kuhlmann.

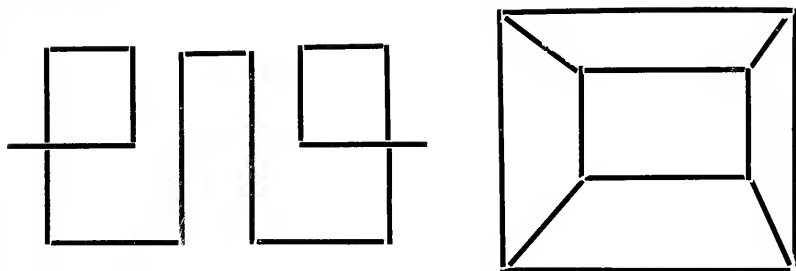
NOUVELLES RECHERCHES SUR LA MESURE DU NIVEAU INTELLECTUEL CHEZ LES ENFANTS D'ECOLE—Alfred Binet. *L'Annee Psychologique*, 1911. Pp. 145-201.

Since the publication in 1908 of the first revision of the Simon-Binet tests for measuring the intelligence of children, the tests have been used by a number of school principals and others in Europe and in America. On the basis of the results, observations, and criticisms thus obtained, Binet now offers a second revision of the tests and further discusses the following questions. (1) What relation is there between the intellectual level and school standing? (2) What effect on the results has the repetition of the examination of the same child? (3) How do teachers generally estimate the intelligence of children? (4) What difference is there in the intelligence of children of different social conditions?

In revising the list of tests some of the old ones are dropped for the following reasons: (1) Some tests were used twice in different age groups and were too similar. (2) Some could be

passed independently of intelligence; these are giving the age, the number of fingers, and naming the days of the week. (3) Some depended too much on schooling; these are reading, writing from copy, and writing from dictation. Tests of the old eleven year group are put into the new twelve year group. No tests are given for the eleven and thirteen years of the old system, and new groups of old and new tests are made up for fifteen years and for adults. The new tests introduced are as follows:

(1) Copying two forms from memory. (Ten year group) The following forms are shown together for ten seconds, and the child then draws them from memory. The test is passed if one is drawn correctly and the other half correctly.



(2) Suggestion of length of lines. (Twelve year group) On each page of a booklet of six pages are a pair of lines side by side and one centimeter apart. On the first page the lines are four and five centimeters long, respectively, on the second page five and six centimeters, and on the third, six and seven centimeters. On the last three pages the lines are equal, seven centimeters. Begin with the first pair and ask, "Which is the longer here?" Repeat the same for the second and third, changing the question to "And here?" for the last three. The test is passed if two of the last three answers are correct.

(3) Difference in meaning of abstract terms. (Adult group) Ask the following: What is the difference between,

- a. Idleness and laziness?
- b. Event and advent?
- c. Evolution and revolution.

This is part of the old thirteen year group.

(4) Passage to summarize from memory. (Adult group) Read the following passage once slowly and with emphasis, telling the child that he will be asked to repeat from memory the essential meaning of the passage:

"There have been quite different opinions on the value of life. Some esteem it very highly, others, very poorly. It would be more correct to take a middle ground between the two. For, on the one hand, it always gives us less happiness than we wish, while on the other hand, it gives us less misfortunes than others wish for us. It is this mediocrity of life that makes it just and prevents its being radically unjust."

(5) Distinguishing between a president and a king. (Adult group) Tell the person: "There are three principal differences between a king and a president of a republic. What are they?"

No changes in the old system are made in the three to five year groups, inclusive. The revised list is as follows:

SIX YEARS

1. Distinction between morning and afternoon.
2. Definition of known objects according to use.
3. Copying a diamond.
4. Counting thirteen pennies.
5. Aesthetic comparison.

SEVEN YEARS

1. Showing right hand and left ear.
2. Describing a picture.
3. Execution of three simultaneous commands.
4. Counting the value of stamps, three one cent and three two cent.
5. Naming four colors.

EIGHT YEARS

1. Comparing two objects from memory.
2. Counting backwards from twenty to one.
3. Recognition of missing parts in pictures of faces.
4. Giving the date.
5. Repetition of five numerals.

NINE YEARS

1. Making change, nine cents out of twenty-five (Godard's Adaptation)
2. Definition better than according to use.
3. Recognition of nine pieces of money.
4. Naming the months of the year.
5. Comprehension of easy questions. (Probably first series of X, 4 of old list.)

TEN YEARS

1. Arranging five weights in the order of their weight.
2. Copying two forms from memory.
3. Criticism of nonsense sentences.
4. Comprehension of difficult questions. (Probably second series of X, 4 of old list.)
5. Using three words in two sentences.

TWELVE YEARS

1. Suggestion of length of lines.
2. Using three words in one sentence.
3. Giving more than sixty words in three minutes.
4. Defining three abstract words.
5. Words to put in order.

FIFTEEN YEARS

1. Repetition of seven numerals.
2. Rhyming words.
3. Repetition of one or more sentences with twenty-six syllables.
4. Interpretation of a picture.
5. Problems of diverse facts.

ADULTS

1. Drawing a cut in a twice folded piece of paper.
2. Drawing the figure of two juxtaposed triangles.
3. Distinguishing between a president and a king.
4. Distinguishing between abstract terms.
5. Passage to summarize from memory.

The rule for determining the mental age of a child from the

results with the new list of tests is as follows: A child is of the mental age of the last group in which he passes all the tests, plus one year for every five additional tests that he passes beyond this group. The author thinks that the revision will give no important difference in the results, but that it should take less time to make an examination since there are now less tests. Norms for the present list have been obtained from public school children, some of which are given for illustration. They are similar to those published for the 1908 tests, allowing for the fact that in the 1908 tests only children who were "regular" in their school work were tested, while now all were tested just as found in the public schools. By "regular" is meant children who are neither advanced nor back in their school work according to their chronological ages.

Correlating the school standing of ninety-three children, for which he gives figures, with their grade of intelligence as determined by the tests, shows a quite close relation between the two. Only one of superior intelligence, according to the tests, was retarded in school work, and none of inferior intelligence were advanced in their school work. Repeating the tests on the same children at intervals of two weeks gives a slight rise in their grade of intelligence as thus determined. In answer to the question as to how teachers generally estimate the intelligence of children it is pointed out, first, that some of the factors that influence their judgment of intelligence are unconscious, while others are consciously sought. Under the latter class an array of "signs," traits and evidences of intelligence coming under common observation are summarized from answers to a questionnaire sent to a number of teachers. These cannot be reviewed here. He concludes that while judging from such evidence may be sufficient for ordinary school purposes, the results from the present system of tests give a more accurate estimation of intelligence. The intelligence of children varies with parents in different social conditions. Children of the leisure classes and of the rich are more intelligent than children of the poor. This conclusion is reached from a careful analysis of Decroly and Degand's data with these tests. Some of his own results, however, on fifty

children from different social conditions, do not show this correlation, and he concludes that the social differences in this case were probably not great enough to show any effect in the results. From another group of thirty children a superiority of intelligence in the children of the rich is again seen.

In considering the amount of data on the basis of which the present revision of the tests is made, it strikes one that the revision is somewhat premature. The norms for the 1908 tests were from two hundred normal children. The criticisms suggesting defects in the system have come from sources that had less than this on the basis of which to suggest corrections. The new tests that are introduced are also based on hardly more extensive norms than were at hand for the old ones that are dropped from the list. The same holds true for the shifting of some tests from one age group to the other. From the reviewer's experience in examining a thousand feeble-minded children with the 1908 tests he does not feel that the changes made are for the better in all cases. However, on the whole, the revised list is undoubtedly an improvement over the old one, and no one could be half as well qualified to make revisions on the basis of meagre empirical data as is the author. We welcome, especially, the change making the number of tests in each group beyond the five year group the same, and regret that this was not done for the four and five year groups also. It eliminates some inherent difficulties in determining the mental age from the results according to the rules given. The old system was also undoubtedly too pretentious in attempting to measure the small differences in mental development between the higher ages, from about nine to thirteen. The new system increases the age units it attempts to measure for the upper part of the scale, and is surely a change in the right direction.

F. Kuhlmann.

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MINUTES OF THE ASSOCIATION

The thirty-fifth annual session of the American Association for the Study of the Feeble-Minded met at Polk, Pa., June 15, 1911.

Members and guests present were as follows: Dr. George Mogridge and Dr. P. F. Lange, Glenwood, Iowa; Dr. Velura E. Powell, Red Oak, Iowa; Dr. and Mrs. E. J. Emerick, Columbus, Ohio; Dr. Bertha C. Downing, Worcester, Mass.; Dr. George W. Wallace, Wrentham, Mass.; Dr. B. W. Baker, Laconia, N. H.; Mr. W. T. Bradberry, Dr. W. J. Langfitt, Dr. Theodore Diller, Hon. Marvin F. Scaife, Dr. C. H. Henninger, Dr. E. Bosworth McCready, Pittsburg, Pa.; Dr. C. S. Little, Thiells, N. Y.; Dr. and Mrs. Charles Bernstein, Rome, N. Y.;

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Dr. W. E. Fernald, in the absence of the president, Dr. A. R. T. Wylie, called the association to order at 9:30 A. M., and introduced Mr. W. T. Bradberry, of Pittsburg, President of the Board of Trustees of the institution at Polk, who welcomed the association.

Mr. Bradberry: Ladies and gentlemen of the association for the care of the feeble-minded, and visitors.—I feel somewhat embarrassed at having to talk to an association of this kind. However, I might say in answer to a number of questions which have been asked in regard to this institution that it was founded in 1894 and ready for occupancy and formally opened in 1897. The general plan as originally outlined has been carried out and with the addition of one or two more buildings the plant will be complete. The plans for the entire plant were made as a whole but of course, like all other institutions, it has been built gradually. We are glad to have you here to-day and we want you to feel at home; we want you to look over our institution and will be glad to have you criticise and if you can find anything in which we can improve we want to know it. I am sure you are welcome, very welcome. On

the part of the trustees and the officers of the institution and the state of Pennsylvania, I welcome you.

Dr. Fernald, in behalf of the association responded:—Mr. Secretary and ladies and gentlemen.—Without my knowledge, the secretary put my name on the program as the member who is to respond to the address of welcome. In behalf of this association I thank you for the gracious and cordial welcome which you and Dr. and Mrs. Murdoch and the officers here have extended to us. We who came here eleven years ago knew the kind of welcome we would receive. The younger members have heard so much about Polk that they have very unanimously responded and this promises to be one of the most successful of our meetings. Personally, my recollection of our former visit here is very distinct. We see some additions to the plant. The thoroughness with which the institution had been planned and the care and attention to detail and perfect equipment were very evident then. Dr. Murdoch is a very modest man and may have failed to tell his board of trustees that this institution is to-day considered the most magnificent and finely equipped institution for the care and training of the feeble-minded in the world and personally, I am sure that you sincerely agree with me that your accomplished and talented superintendent is among the leaders of this work.

This association began in Philadelphia in 1876 at the suggestion of Dr. Kerlin, of sainted memory. This institution has had a very large share in the enormous development of the principles which underlie the care of the feeble-minded and their treatment. When we met here eleven years ago the majority of applications for admission to our institutions were based upon the need of the child himself. That was the burden of our papers before the association. It was a philanthropic purpose. Now the applications for the training of feeble-minded children rarely mention the child himself. It is taken for granted that the child is entitled to care and training and whatever he needs. The older members, like Dr. Rogers and myself, who remember that our early sessions were spent largely in inaugurating and propagating the work in the various states are rather appalled

to-day by the demands of the legislatures that we take care of all the feeble-minded. And everywhere men are not only appalled but are beginning to insist that we must find some other way to handle this problem. The school classes for backward children have answered this question temporarily. The association, no doubt, will take up some of these problems at this convention.

I think that those who visit our meetings for the first time are amazed, disappointed I might say, at the informality of our sessions. Now these informal meetings and these informal discussions are infinitely more valuable than any of the discourses which we formally read. We meet each other and we work out the personal equation of these men and when we read the very interesting annual report we are helped in working out our own personal problems. To my mind the greatest good which we get from these sessions is obtained in these private conversations. Once more, in behalf of the association, I thank you for your welcome.

The following persons were elected to membership: Active—Dr. B. W. Baker, Laconia, N. H.; Dr. Fred Kuhlmann, Faribault, Minn.; Dr. P. F. Lange, Glenwood, Iowa; Mr. Bleecker C. VanWagenen, 443 Fourth Ave., New York City.

Associate—Dr. Frank P. Davis, Enid, Okla.; Dr. J. F. Munson, Sonyea, N. Y.; Dr. A. B. Moulton, Faribault, Minn.; Dr. Henry B. Gaynor, Dr. James E. Dwyer, Polk, Pa.; Dr. T. L. Taylor, Dr. Nellie Hanaway, Fort Wayne, Ind.; Dr. A. P. Herring, Dr. W. P. Winterode, Baltimore, Md.; Dr. Roy Moon, Dr. L. T. Sidwell, Glenwood, Iowa.

A letter of greeting was received from Dr. H. G. Hardt.

No other communications having been received at this time and no other business coming before the session the members and visitors devoted the remainder of the morning to an inspection of the schools, industrial and custodial buildings, laundry, power plant, bakery, kitchens, clothes-rooms and cottages, reaching the children's dining rooms at 12:30 to see the children assemble for their mid-day meal. After luncheon the farm, barns, henneries, piggery, cold storage, ice plant, store

houses and filtration plant were visited, carriages being at the disposal of the guests for this inspection.

At 7:30 P. M. the school children presented an operetta entitled "Cinderella in Flowerland." This was a particularly bright and tuneful little opera and splendidly given. The training of the children, the designing of the costumes and stage decorations were most commendable and the teachers in charge were highly congratulated upon the success of their work.

At 9 P. M. the session was again called to order by Dr. Fernald who introduced the president, Dr. A. R. T. Wylie, who had arrived on an afternoon train. The President's address was then given.

Dr. Theodore Diller, of Pittsburg, followed this with a paper entitled, Some of the Practical Problems Relating to the Feeble-Minded as They Appear to a Neurologist.

The following committees were appointed by the chair: On organization, Dr. W. E. Fernald, Dr. George Mogridge and Mr. A. E. Carroll; on time and place, Professor E. R. Johnstone, Dr. E. J. Emerick and Dr. George W. Wallace.

Adjourned until next morning.

June 16. Session called to order at 9 A. M. Letters of greeting from Dr. George A. Brown and Dr. Edmund B. Huey were read. Dr. Fernald then read a paper on The Defective Delinquent.

Following this Dr. Kuhlmann read a paper on The Simon-Binet Tests. This was a report on the examination of 500 cases at the Minnesota School for Feeble-Minded and in presenting this report **Dr. Kuhlmann** exhibited most interesting charts to illustrate. Dr. Goddard opened the discussion on this paper and presented charts further illustrating the Binet tests. Dr. Lange followed Dr. Goddard in the discussion and the subject was taken up generally and participated in by many attending the meeting. Many interesting points were brought out and the matter of standardizing the tests in such a way as to make them suitable for use in any part of the country taken up at length. It was unanimously decided that the association should take steps to start this movement and that research and record

work should be taken up by each institution. The discussion on this subject continued until luncheon time and the meeting was adjourned until afternoon.

At two o'clock the session was again called to order in Kerlin Hall and a very interesting paper on the Color Sense in the Feeble-Minded read by Dr. Bertha C. Downing.

Dr. Henry B. Gaynor followed with a paper entitled The Attendant Nurse of the Feeble-Minded—Her Recognition.

Dr. C. H. Henninger then read a paper on The Feeble-Minded Outside the Institution and Their Relation to Society.

Following the reading of this paper a large party of visitors from Franklin and nearby towns—members of the clergy and of the Venango County Medical Society, with families and friends—was ushered into the hall, making an attendance of nearly two hundred at this session.

After an interesting discussion of Dr. Henninger's paper, Dr. E. Bosworth McCreedy presented a paper entitled Some Cases Illustrating Conditions Simulating Feeble-Mindedness, and Dr. J. Irwin Zerbe followed with a paper on Disturbances of the Thyroid Function.

Dr. William Healy, of Chicago, who had arrived at Polk during the morning, was called upon by Dr. Rogers to give a talk on the Binet tests. This was really a continuation of the discussion carried on at the morning session and occupied the attention of the association until the dinner hour. Dinner was served upon the lawn, the band playing a number of splendid selections under the direction of their leader, Mr. William Sutley. The large court to the south of the administration building was used for this lawn party and a very pretty sight it was, the members of the association meeting and mingling with the physicians and visitors from surrounding towns, and the officers and teachers of the institution, under the direction of Mrs. Murdoch, catering to the wants of all.

At 7:30 P. M. a children's dance was held in Kerlin Hall and very much enjoyed by all.

June 17. **Session called to order** by the president at 9 A. M. Treasurer's report for the year 1910 and 1911 presented.

Committee to audit same appointed as follows: Dr. A. W. Wilmarth and Dr. W. H. C. Smith.

Committee on organization reported as follows: For President, Dr. H. G. Hardt, Lincoln, Ill.; Vice-President, Mr. A. E. Carroll, Fort Wayne, Ind.; Secretary and Treasurer, Dr. A. C. Rogers, Faribault, Minn.

Editorial Staff, Dr. A. C. Rogers, editor-in-chief, Associates, members of old board with the addition of Dr. William Healy, Chicago, Ill.

Committee on time and place reported it impossible at this time to decide upon place of meeting for next year and asked to have time extended for the making of their report. If possible they wish to arrange meeting at the same time and place as the Association for the Study of Epilepsy. On motion, their request for extension of time was granted. On motion the secretary was instructed to return the greetings received from the Association for the Study of Epilepsy and notify them that the meeting of next year has been referred to special committee on time and place to learn if we can hold meeting conveniently to both associations.

Dr. B. A. Black then read a paper on Some Eye, Ear and Throat Conditions Common to the Feeble-Minded.

Dr. A. B. Moulton's paper on Measles in a State Institution was read by Dr. Bernstein and following this Dr. C. B. Davenport's Census of the Feeble-Minded in Institutions and Poor Houses was read by Prof. E. R. Johnstone.

Committee on audit reported treasurer's report to be correct. On motion, the report of committee on audit accepted.

Committee on classification recommend that this committee be continued another year so that they may have a more definite report to present. On motion, this committee was continued to report at next year's meeting. Letters of greeting to the association were read from Dr. William N. Bullard and Miss Sullivan.

The following communication from Gov. John K. Tener was then read:

Harrisburg, June 14, 1911.

J. M. Murdoch, M. D.
Polk, Pennsylvania.

Dear Sir:—

The Governor desires to express his appreciation of your kind and thoughtful letter of the 8th instant, inviting him to be present at the meeting of the American Association for the Study of the Feeble-Minded, at Polk, on June 15th, 16th, and 17th, 1911, and to express his regret that his official engagements for the dates mentioned are such as to make his attendance impossible.

Respectfully yours,

W. H. GAITHER, Private Secretary.

Prof. Johnstone then took the floor and in fitting and appropriate manner expressed the appreciation of the association for the hospitality and kindness shown the members and visitors by the officers and teachers at Polk, "which of course," said Mr. Johnstone, "all goes back to Dr. and Mrs. Murdoch." and moved that the association pass a resolution of thanks to the good Doctor and his charming wife, their assistants and all connected with the institution for their generous hospitality and many kindnesses during the period of the meeting. Adopted by a rising vote.

Committee on research appointed as follows: Prof. F. R. Johnstone, chairman, Dr. W. E. Fernald, Dr. A. C. Rogers, Dr. William Healy and Dr. Fred Kuhlmann.

REPORTS FROM STATES

Dr. Rogers: I want to report that Vermont, with its population of only 330,000, has made the first definite move for the location of a permanent institution. This institution is to be located at Brattleboro and to be known as the Austine Home for the Feeble-Minded. A gift of \$50,000 has been made and in 1911 the legislature appropriated another \$50,000 to be added to this gift. Work will be started as soon as possible.

Mr. Johnstone: North Carolina has just appropriated an amount for the establishing of an institution at Washington, that state. They have, or are about to receive a gift of a certain number of acres of land at Washington and will proceed

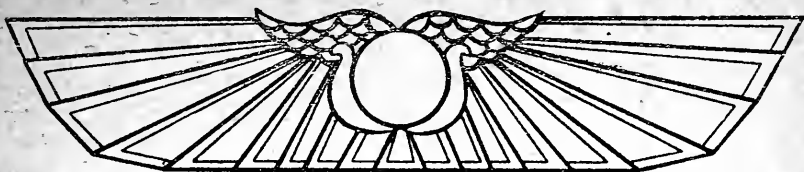
with plans, etc., as soon as they can. More definite information in regard to this institution may be obtained from Dr. I. M. Hardy, Washington, N. C.

Dr. Murdoch: Pennsylvania has just made an appropriation to provide for its fourth institution for the feeble-minded. The state has appropriated a certain amount, not definitely announced, and the city of Philadelphia has guaranteed to appropriate a like amount for the establishment of this new institution. The institution will be for the feeble-minded children of the city of Philadelphia only.

Mr. Carroll stated that he understood some movement had been started in Oklahoma for the care of its defectives and that information in regard to this work could be obtained through Miss Kate Barnard of Oklahoma City.

The association then adjourned.





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FOR THE
STUDY OF THE FEEBLE-MINDED

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Published Quarterly at
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No. 2

MARRIAGE—RESULTS AND EFFECTS OF HEREDITY. CONSANGUINITY AND ENVIRONMENT

BY MARTIN W. BARR, M. D., ELWYN, PENN.

Marriage in its highest conception has two prototypes: That of the Garden of Eden, where is found the blending of two natures into a perfection best fitted to maintain and carry forward the purposes of the Eternal Good; and later, that of the Divine with Humanity to redeem the great family over which evil had triumphed, and to send forth laborers to tend and dress the fair Garden of Life. Thruout the ages, in many lands, many homes attest the recognition of these high ideals as their one foundation. With peasantry, burghers, gentry and nobles alike may be traced, however adverse the times, the one idea for the defence from evil and the maintenance of good conceptions within the home and, naturally, the community life. Love being the fulfilling of the Law, he who loves God must love his fellow man.

Crime and vice might be rampant, but ever the surest protest against evil and safe-guarding from ill was found in the simple home life alike of poor and rich; and that community esteemed most fortunate, that government most stable, where such homes abounded. Each of us, doubtless, can recall more than one of such, where parents truly one in association of simi-

lar tastes, sentiments and beliefs, find the truest enjoyment of life in a cheerful discharge of its duties and obligations to children and to neighbors. As good comrades and associates in the office of guides and leaders, these heads maintain a dignity and authority commanding respect for themselves and self-respect in those for whom they are responsible; creating an atmosphere of cheerful industry, of quiet refinement, cordiality and goodwill which cannot fail to prove favorable to a healthful procreation and development of children thus foreordained to emulate such examples. To such, the home-building is paramount, money-getting and amusement of secondary consideration, and in communities where such homes are the rule, divorce is not practiced nor even accepted as a subject of conversation.

Marriage has fallen from its high estate of a union only of congenial mates for the furtherance of the Eternal Good, and is dominated by any and every motive, sordid or unclean, sentimental or evanescent. The selfish securing of ease, money, position, or mere emotional indulgence is the motive of many in selection, while excessive excitation in the eager pursuit of either business or diversion has produced in these a neurotic condition not favorable to the production of healthy off-spring. Absorbed in the mazes of finance, of fashion, or of ignoble pursuits, married not mated, these fail to maintain a true nobility of character or position, as heads of families. The home, missing the dignity of true social life with freedom under law, becomes the abiding place of tyranny or license; the children too often left lonely or neglected, or else consigned to the care of subordinates, or to the over-stimulation of the school. From either condition, naturally, the undeveloped, too often misunderstood youth seek escape, either in the excitement of the street or in ill-assorted unions which but emulate what they have known, with a further evolution of degeneracy, the natural result of such heredity and environment.

One may think my pictures of the day over-drawn, but while opinions may differ, facts do not lie. For verification I need but call attention to the deserted farms, the over-crowded cities, the establishment of juvenile courts—a thing unknown in the

past—to the startling increase in the estimated numbers of defectives and of degenerates on many lines, and to the estimated number of divorces within twenty years attaining the million mark.

That heredity must prove a blessing or a blight cannot be too strongly insisted upon; nor can there be a greater incentive to the cultivation of perfection—moral, mental, and physical—than the assurance of the power of procreation and certain transmission of noble qualities, attained through persistent self-control. Race culture once the dominant thought, defect and disease will find sequestration, and no law will be necessary to forbid participation of such in marital relations. In many degenerate cases the sexual emotions are exaggerated, passion taking the place of that pure sentiment of which they are incapable; indeed many, fairly normal but backward, are unable to discriminate between lust and love, nor can they realize that a moment of passion may jeopardize the welfare of hundreds of homes. Ignorance is responsible for much, and unfortunately those who should teach continue to speak with bated breath instead of exercising the truest wisdom and refinement in advising young men and women, as a charity worker once urged upon me, “in language that he who runs may read” of the dangers of the social evil, of venereal diseases, and safeguarding the innocent by advice and warning. Sexual matters should be discussed with discretion, surely, but as intelligently as any other subject relating to race or communal welfare.

The effect upon the world at large of the rapid increase of degeneracy is fast becoming evident. For as soon as that stage is reached where there is a preponderance of diminished vigor of any sort, be it mental or moral or physical, that community or society is surely doomed. Then, if ever, has it need to claim the protection of law; and this is verified by the history of the past. Certainly Noah and the ark is a good object lesson to the student of eugenics.

In marriage, as in the breeding of stock, care should be taken in selection, great care. We are all cognizant of marriages which never should have been. The forbears may not be actual-

ly defective but if there is neuropathic or otherwise diseased stock, imbecility, either mental, or moral, or both, is sure to follow in one generation or another; and acknowledging that we owe something to unborn generations, no one can question the advisability of restricting marriage or preventing propagation by the unfit. Slowly the public is awakening to the call of urgent needs and the movement is already made in some states which have instituted legal restrictions. But they do not yet go deep enough into cause and effect, and, either not recognizing or not accepting the certainty of imbecile transmission, there is as yet no concerted action restricting the marriage of epileptics, imbeciles, and insane. Not only does a commonwealth fail to forbid, but it practically encourages such cohabitation; for, just so long as it raises the burden from incapable shoulders and is willing to feed, clothe and house the off-spring of degenerates, just so long will there be a steady increase of its defective population. Furthermore, it provides not only support but training for these; a training that if it is to accomplish anything in self-support often so effectually conceals defect that recognition of it by the casual observer is impossible, and marriage or enslavement by the vicious and consequent reproduction is too often the natural sequence. And so the work goes on, placing literally a premium on retrogression by freeing the ignorant and indolent from the consequence of folly.

To this a halt must sooner or later be called, and in appealing to workers for the common weal, one cannot urge too strongly such united action regarding this matter that ultimately the marriage or the cohabitation of the unfit may be forbidden. First, by separation, asexualization and sequestration of recognized defectives; second, by the requirement of a certificate from parties seeking marriage license, showing a clean bill of health for at least a generation back, as a matter of simple justice to the coming generation. It is a poor rule that does not work both ways. Those ancestor-worshippers so eager to vaunt the excellencies of their forbears should be impelled to legislation preserving the purity of the race, by a mere sense of noblesse oblige.

The generally accepted belief that consanguineous marri-

ages are attended with disastrous results—mental and physical—to off-spring, is founded upon an entire misconception of cause and effect; a misconception surely not aided by the observation of the union of bodies, organic or inorganic. Here, experience dictates alike to the simple and to the scientific; alike in the arts and crafts, as in the experiments of the laboratory, that the union of strength with strength gives added power, as does a commingling of strength with finer, more delicate materials, the proportionate modification sought—a fact with which all stock-breeders are familiar. The natural inference, therefore, would be that if the life of a race or of a family be simple and strong, free from nervous excesses and consequent excitations, the intermingling of its numbers would conduce to progress rather than to deterioration. Examples are not wanting in proof of this. Witness the Jews, where intermarriage was for years the rule rather than the exception; and while certain characteristics are accentuated, degeneracy, up to this day, is the exception rather than the rule.

A study of conditions in the Commune of Batz, a peninsula of the Loire Inferieure, France, shows a community of some 3,300 inhabitants leading clean, simple lives, among whom crime and intemperance are unknown. For many generations they have intermarried yet no cases of degeneration, mental, moral or physical have occurred, and the number of children is above the average. A slight taint may, by a suitable marriage, be diminished, and with further admixture of pure stock be finally eradicated. Although the offspring may appear to resemble one parent, it is in reality a mixture of both and this is one of nature's means for bringing about modifications of the race. Indeed Langdon Down goes so far as to say, "I am by no means sure that by the judicious selection of cousins, the race might not be improved."

A judicious selection! Ay, there is the crux of the whole matter! Let us but exercise the same care in the selection and mating of human beings that we do with beast and fowl, and degeneracy and crime might not only fast disappear from our midst, but strength and beauty, physical, mental and moral, might

have opportunity to surpass all preconceived ideals. It cannot be denied that the offspring of consanguineous marriages have been found defective, but where the blood is pure and uncontaminated, this is the exception and not the rule. Students of the subject agree that such connections are not harmful unless there be distinct neurosis in the families when intermarriage will but intensify a fateful heredity.

Howe, in his initial investigations, notes forty-four idiots, the result of seventeen consanguineous marriages; but the parents were intemperate and scrofulous, each constituting a cause in itself. Beach and Shuttlesworth, who have studied the cause of mental defect in 2,380 cases, find consanguinity accountable for only 4.20 per cent. Down, in 2,000 cases, seven per cent., and my own study of 4,050 cases, but 1.21 per cent., and in the majority of these there was bad heredity. I know of one instance where for seven generations covering a period of over 100 years a family has married and intermarried, over eighty idiots and imbeciles being the result; but this also proves only a concentration of neuroses as disease was rampant in the family.

A short time since I was called in consultation to give an opinion regarding the marriage of two members of a cadet branch of a noble English family, who, first cousins, resembled each other in every respect—coloring, hair, eyes, disposition, temperament and taste. Unhesitatingly I advised against it, the family history showing a pronounced neurosis which, undefended by the intermixture of purer blood, would most likely reappear in a later generation. Like should never mate with like unless there be strongly counterbalancing qualities.

Bemiss, in an exhaustive study of 833 consanguineous marriages, finds 3,943 children. Of these, 1,034 were defective—308 idiots, 145 deaf and dumb, 300 scrofulous, 85 blind, 38 insane, 60 epileptic and 98 deformed, while 883 died in early infancy. These statistics appear appalling at first view of what an intensified current may achieve in carrying forward defect, latent though it may be for generations; but, although interesting, the statement does not prove a malign law in consanguinity, alone, since it goes on to show that the majority were the offspring of either

intemperance, defect, disease or gross immorality. A consideration of data and argument on both sides finds as a truism that a baneful heredity is the source of ill, while consanguinity is but heredity intensified. Hence, there appears a consensus, which my own personal observations confirm, that consanguinity is simply a question of morbid heredity and in few cases responsible for defect, *per se*.

Environment, as effecting marriage and its resulting offspring, should be considered first in its possible influence upon mothers during the period of gestation. To this condition I, in a study of some 4,050 cases, attribute 352 or 8.69 per cent. Again, poverty, loneliness, over-fatigue, worry and lack of incitement on the one hand, as excess, unrest and over-stimulation, on the other, would induce a condition of malnutrition apathy or nerve-tension conducive, among those with no inherent stamina or resistance, to either defect or insanity. While records of extrinsic or environmental influences in the actual production of defect, such as that of the Wild Boy of Aveyron and Casper Houser, are rare, there can be no doubt that the many adverse factors, improper feeding, malnutrition, over-crowding or isolation, poor ventilation, ill-treatment, over-excitement or general neglect, must undoubtedly hinder the awakening of mental and moral faculties, while contributing largely to the development of any latent inherited neuroses. Contrarywise, a favorable environment is esteemed indispensable to the awakening of dulled faculties, and it is in this that Guggenbuhl ascribes much of the success of the Abendberg.

Certain races, not always the most intellectual, indeed some uncivilized there are, in both past and present, who, regarding environment of great importance, surround their women anticipating motherhood with all that is most beautiful, believing, and truly, that such natural impressions cannot fail to influence the child. May not we then who claim the highest intellectual status follow where these lead and using heredity, consanguinity and environment as aids, not foes to a noble end, come at last to regard marriage as a means of securing and maintaining true race ideals?

SOME CASES ILLUSTRATING CONDITIONS SIMULATING FEEBLE-MINDEDNESS

BY E. BOSWORTH McCREADY, M. D., MEDICAL DIRECTOR, HOSPITAL-SCHOOL FOR BACKWARD CHILDREN,
PITTSBURGH, PA.

To the experienced observer it is, as a usual thing, a matter of no very great difficulty to make a diagnosis of mental deficiency. It is, however, not so easy to differentiate cases of essential feeble-mindedness from those only apparently so, or from those which are likely to ultimately become feeble-minded by reason of partial or complete deprivation of some faculty. The human brain is not a homogeneous mass but an intricate mechanism depending for its efficiency upon the structural arrangement of its ultimate elements. The growth of each element depends not only upon stimulation of its own protoplasm by use, but also upon stimulation of contiguous elements, lacking which it atrophies and becomes inefficient. Mental deficiency amounting to feeble-mindedness may thus result from conditions which early recognition, at a time when suitable remedial measures could have been instituted with a fair promise of success, would have prevented.

It is not within the intended scope of this paper to take up the consideration of the numerous conditions in which a differential diagnosis from feeble-mindedness must be made, but merely to illustrate a few of such conditions by citing a number of cases met with in private practice and in the laboratory-clinic of the Hospital-School for Backward Children, in which the possibility of feeble-mindedness suggested itself to the writer. The role of biologic variations in special cerebral centers in the causation of relative mental deficiency likely to be mistaken for feeble-mindedness first presented itself to me early in 1909 when I met with the following case of congenital word-blindness,

which was reported in a paper read before the Pennsylvania Medical Society, Sept. 1, 1909.*

R. E. W., aged twenty, negative family history. Early development was normal. He had enteritis when an infant and an attack of pneumonia at four years from which he made a good recovery. He tells me that he had great difficulty in reading from the time he began to attend school at the age of six years. At the age of ten he was subjected to a severe fright after which he began to stutter. He had always been backward in school, drifting about from private to public schools, to private tutors, until his parents had despaired of his ever gaining even the most elementary education. They had come to consider him feeble-minded. The patient first applied to me for treatment for stuttering on March 22, 1909. Examination showed a well developed boy in good physical condition. Dr. E. W. Day to whom he was referred for an examination of the nose and throat reported nothing abnormal. Dr. Edward Stieren reported that examination of his eyes showed a high degree of hypermetropia with a moderate amount of atrophy of both disks; color, form sense and muscular balance were normal. The patient was very shy and self-conscious. His expression was dull and stupid and his movements awkward. His stuttering was so bad that the least attempt to speak threw him into a state of panic. He, however, entered into the exercises directed toward the correction of his speech defect with a great deal of interest and made rapid progress. I found, however, that when asked to read simple verses and bits of prose that he stuttered as badly as ever, although he could repeat them after me or from memory, very fluently. When he was able to enunciate the word he would, likely, call it something entirely different from what was printed; for instance, saw, he pronounced was; words, wan; at, an; sober, soder; remember, remain; because, beauties; justice, jessive; form, from; beneath, bent; etc. Very few words at all was he able to pronounce even incorrectly

*E. Bosworth McCready: Congenital Word-Blindness as a Cause of Backwardness in School Children. Report of a Case Associated with Stuttering. Pennsylvania Medical Journal, January, 1910.

without an appeal to his glosso-kinaesthetic center by forming the sounds with his lips and tongue. In other directions his mentality was normal. The patient was a boy of at least average intelligence whose combined defects of visual memory and speech had not only prevented him from making progress along educational lines but had also interfered with the proper expansion of personal characteristics. Necessarily his vocabulary and power of expression were very limited. He showed wonderful strength of purpose in following up the treatment directed toward the eradication of his defects. The object aimed at in the treatment of this case, after the correction of the speech defect, was the development of the visual word center in the right hemisphere and the establishment of functional relationship between it and the auditory word center, as well as Broca's center in the left hemisphere. To this end the patient was first taught to use his left hand. He was then made to receive oft-repeated impressions of words through every possible avenue; through his auditory center by hearing words pronounced and hearing himself pronounce them, which last also brought his glosso-kinaesthetic center into play; by tracing over words at dictation, at the same time pronouncing them himself, thus bringing all the centers involved in speech in accord at the same time. In addition he was given visual impressions of words in as many forms as possible, written, printed, on paper, on the blackboard, cut out of cardboard, on the spelling board, etc.

The patient was under training for about a year and the result has more than warranted the expenditure of time and energy required. He not only is able to speak fluently and without the slightest hesitation but can read ordinary printed matter as quickly as a person with normal visual memory. His intellectual advancement in other directions has been equally gratifying.

A number of other cases of congenital word-blindness have since come under my observation; in none of them, however, was it possible to make as close a study as in the one above cited. In several, the period of observation was not sufficiently long to entirely eliminate the possibility of essential deficiency.

In fact, the frequent occurrence of word-blindness in the feeble-minded increases the necessity for careful study of these cases.

The following case, however, already reported, is one in which a diagnosis of word-blindness causing relative deficiency or backwardness is justifiable:* George T., aged thirteen years. Examined first, February 25, 1910. Entered school at the age of six years. He had progressed no further than the second grade, having missed five promotions. His teacher reported that he was very obedient and tried hard but seemed unable to learn anything that required reading. The family history was negative as far as anything bearing upon the boy's condition was concerned. His birth and early development were normal in every respect. He seemed very bright during infancy and early childhood. Physical examination showed a boy of shy appearance in good physical condition. He had a slight degree of nasal obstruction due to a small amount of adenoid tissue in the nasopharynx. There was no apparent error of refraction. He had a fair amount of general information, took part in the games of his companions and showed average intelligence in everything not connected with his school work. He was taking piano lessons and making very good progress as he read musical notes with ease. I found, however, that he could name correctly but a few of the letters of the alphabet: z, he called s; l, he could not name at all; r, he called b; p, he called r; t, he called f, etc. He was unable to read even the simplest words, calling dog, you; yes, our; may, did; on, he would not attempt. His recognition of numerals was good. He could do simple multiplication, addition, and subtraction.

This patient had been under training but a short time when family difficulties made it necessary for him to go to work. The time was sufficient, however, to demonstrate the fact that it was possible to teach him to read, as he had become able to recognize a number of words.

A condition, in my experience, not so common as congenital

*E. Bosworth McCready: Biological Variations in the Higher Cerebral Centers Causing Retardation. *Archives of Pediatrics*. July, 1910.

word-blindness but productive of a greater degree of retardation, is congenital word-deafness. The development of the intellectual processes is dependent to a greater extent upon the faculty of speech than upon any other. The natural development of speech depends upon the possession of normal hearing ability. In congenital word-deafness there is no involvement of the general auditory area, the variation lying in the auditory word center alone. In this condition words are heard merely as noise, or impressions only of certain sounds making up, may be received. When there is complete word-deafness the danger of a mistaken diagnosis is increased. It is obvious that the child does hear and his failure to understand is very likely to be attributed to lack of intelligence.

V. L., aged five, referred by Dr. W. P. Barndollar, on account of mutism.* First examination, April 11, 1910. Family history negative except that a maternal aunt died of tuberculosis. Her birth was normal and there was nothing unusual in her early development. She had never been really ill. Enlarged tonsils and adenoids were removed several months before she came for examination. She was a very healthy, alert-looking child, with apparently normal mentality in every direction with the exception of her inability to talk. Dr. Barndollar stated that she was not deaf for ordinary sounds. She, however, was unable to understand anything that was said to her, although she was very expert at interpreting actions accompanying verbal directions or commands. She also seemed to be able to use lip reading to some extent. Efforts at speech were confined to a few unintelligible sounds. Diagnosis was made of word-deafness with consequent mutism. This case was, unfortunately, lost sight of and the benefit to be gained by training could not be estimated.

When the word-deafness is but partial and the power of appreciation of certain sounds only is present, idioglossia results. Idioglossia may result from other causes, but I have found partial word-deafness to be the most usual one. Upon being

*E. Bosworth McCready: Biological Variations in the Higher Cerebral Centers Causing Retardation. *Archives of Pediatrics*. July, 1910.

confronted with a child with idioglossia the temptation would be to put him down at once as feeble-minded, especially when his speech defect is combined with a marked degree of aprosexia, as is often the case. These children come very often under the observation of those who have much to do with feeble-minded and backward children and it is of utmost importance to the future of the child that a correct diagnosis be made. As Coleman says, "Although the children are often intelligent and quick, the difficulty of making themselves understool gives other people the impression that they are idiots."*

R. B., aged five years. First examined March 20, 1911. Family history negative. His early development was normal except that he was late in attempting to talk. He had several attacks of pneumonia. At the age of three years he fell out of a second story window, after which he was unconscious for a short time but apparently received no permanent ill effects. He is a well developed, intelligent looking boy with no particular anomalies except diseased tonsils and adenoids the removal of which is indicated, and an error of refraction for which he is wearing glasses prescribed by Dr. Stieren. Dr. J. Homer McCready states that there is no ear disease and that he responds well to all hearing tests. Mental examination and subsequent observation in the training department of the Hospital-School shows him to be possessed of mental capacity somewhat above the average for his age. When he first appeared for examination he spoke a jargon, unintelligible except to his immediate family who had found that he always used certain sounds to denote certain actions or objects. Speech analysis after a period of training showed that he could pronounce all of the vowels correctly and from dictation all of the consonants, except the following: L, which equaled M; W, equaled dum dum; X, equaled eech; Y, equalled yi. Spontaneously, gloves was pronounced gum; waist, yais; nose, no; ear, e; head, hen; pencil, penkil; light, quite; letter, ye ye; ink, ick; glass, ga ga. It seems in this case that we have a primary partial word-deafness, with consequent imperfect ap-

*Leonard G. Guthrie: *Functional Nervous Disorders in Childhood*, 1907.

preciation of verbal sounds resulting through attempts at reproduction in faulty glosso-kinaesthetic memories. The child has improved markedly under training, though this has been much interfered with by an attack of measles.

Partial or complete general deafness not only gives rise to retardation, but may be the cause, at times, of a mental state not easily differentiated from feeble-mindedness. In young children it is often a matter of difficulty to determine whether the hearing is really at fault or whether, with normal hearing, there is merely lack of understanding. When deafness, congenital in origin, is found to be present, feeble-mindedness cannot be excluded until after attempts at education have been made.

L. D., aged five years. First examined Oct. 3, 1910. Father is alcoholic. One maternal aunt died of tuberculosis. His early development was normal except that he made no attempt to talk until the age of two years and that since then he has gained a vocabulary of but a few words. It was noticed that he would sleep through any amount of noise. Adenoids and enlarged tonsils were removed when he was four years of age. Physical examination shows a well formed, handsome boy with no gross anomalies. Dr. J. Homer McCready reported that the ear drums are thickened and retracted and that though his hearing is practically normal at the present time, because of mechanical obstruction he was likely deaf before the adenoids were removed. The child when brought for examination was very restless and inattentive, distracted by the slightest noise. The mother stated that this had been the case since the operation upon his nose and throat. His concentration was so poor and his excitability so great that a tentative diagnosis of imbecility was made. He was, however, admitted to the training department of the Hospital-School for observation. It was found that he had but the slightest ability to differentiate sounds of any kind. Even the sense of direction of sound was lacking. In short, the child heard but did not realize that he heard or that there was any difference in the impressions received upon the auditory centers. Special training has accomplished a great deal for this child. He is now normal in every way, except that he does not yet speak

as plainly as the average child of his age. He will be able to enter the public school at the beginning of the next term.

A. L., aged four and three-fourths years. First examined Oct. 19, 1910, on account of retarded mental development, aprosexia and partial mutism. Family history was neagtive. She had pneumonia at fourteen months and a very light attack of measles at sixteen months. Her early development was normal except in regard to talking. She could say a very few words at sixteen months. Since that time there has been but very little development of speech. Tonsils and adenoids were removed at three years. She was left-handed. The patient was a very well developed child for her age. Her osseous development as shown by a radiograph of the wrist was that of a child several years older. While in repose there was nothing to suggest anything other than a normal, healthy child. It was very difficult, however, to gain her attention or to keep it fixed for any length of time. There was very little effort at speech although she seemed to understand almost everything that was said to her. Her response to mental tests, however, was so good that I suspected that the difficulty lay in her hearing, and that her understanding of speech was based upon lip-reading and apt interpretation of gestures and motions. Careful testing showed that she was deaf to all but very loud and high-pitched sounds. Dr. J. Homer McCready to whom she was sent for further examination reported that the membranes were in good condtion but corroborated the diagnosis of deafness. It seemed strange that the deafness, which was congenital, had never before been discovered as the child had been examined repeatedly, and had been the object of the greatest solicitude on the part of the parents. There was a sufficient amount of hearing remaining in this case to warrant the attempt at its development. As the patient lives at a distance it has been impossible to keep her under observation though the parents report that she is showing improvement under the training suggested.

DR. AYRES' CRITICISM OF THE BINET AND SIMON
SYSTEM FOR MEASURING THE INTELLIGENCE
OF CHILDREN*—A REPLY

BY DR. F. KUHLMANN, FARIBAULT, MINN.

In this article Dr. Ayres wishes to "sound a note of warning against accepting these tests in their present form as final and satisfactory," and states as his further object to "present considerations which lead the writer to believe that what we must have is a new instrument rather than the re-adjustment of the old; an instrument utilizing what is good in the old, but largely planned on different principles and constructed along different lines." This general conclusion is in direct contradiction to the findings of all who have used these tests extensively and have published their results, and together with his discussion of the more specific criticisms leaves the impression that the system is too defective to be of any great practical service. From my own experience in using these tests in examining about thirteen hundred of the inmates of the Minnesota School for Feeble-Minded I cannot agree with this view taken by Dr. Ayres, and there is much in his more specific criticisms which seems to me erroneous. These criticisms he summarizes as follows:

- "1. The tests predominantly reflect the child's ability to use words fluently, and only in a small measure his ability to do acts.
2. Five of them depend on the child's recent environmental experience.
3. Seven depend on his ability to read and write.
4. Too great weight is given to tests of ability to repeat words and numerals.

*The Binet-Simon Measuring Scale for Intelligence: Some Criticisms and Suggestions. By Leonard P. Ayres. *Psychological Clinic*, Vol. V, No. 6, 1911.

5. Too great weight is given to 'puzzle tests.'

6. Unreasonable emphasis is given to tests of ability to define abstract terms."

I shall take them up in order.

1. Perhaps all are willing to grant that the ability merely to use words fluently is no reliable criterion of intelligence, but neither is the ability merely to do acts. Both may become such only under specially arranged conditions. Language is the most direct indication and expression of thought and mental processes, which latter are the reactions we try to invoke in mental tests. We assume only that the language process shall not in itself be so difficult as to prevent its being a fairly adequate means of expression. But this being granted, we are not testing the ability to use words merely because the tests involve language. Dr. Ayres takes exception to this assumption in the case of the Binet-Simon tests, holding that "two-thirds of them are tests of the child's ability to use words," and that they "predominantly reflect the child's ability to use words fluently." Let us consider some of the instances he cites for illustration. He objects to the "Questions of Comprehension" in Test 4 for ten-year-old children. These are divided by the authors into two series, the words of the first series assumed to be easily understood by ten-year-old children, the words of the second series designed to offer some difficulty of understanding, as for example, "What should one do when he has missed the train?" (first series) and "What should one do when he is detained so that he will be late for school?" (second series). I answer the criticism by asking the reader the question, "Does it require a greater fluency of language to comprehend and answer such questions than we can rightly assume a ten-year-old child to possess?" I am left to infer that Dr. Ayres has misunderstood the aim of this test. A logically correct or even grammatically correct answer is not called for. The test is passed if the answers give merely an indication that he comprehends the situation suggested in the question and gives some intelligent reply. The authors give illustrations in each case of good and bad replies. A glance at these should be sufficient to show that the difference in these replies does not lie in

a difference in the ability to use words fluently. A further objection to these questions is found in the fact that they, "Overlook the importance of habit and of the emotions in influencing action;" that the child who would do just the right thing under the circumstances suggested in these questions, "thereby demonstrates a quality and degree of native ability to which few indeed among us may hope to attain." The latter part of this statement may be quite true, but the tests do not put the child under these exciting circumstances and judge his intelligence from his actions. They test his ability to understand what he ought to do if he were in these circumstances. Apparently in this same connection he objects to Test 1 for eleven-year-old children, in which the child is asked to point out the nonsense in each of a series of statements, on the grounds that the statements are "blood-curdling" and may "constitute a serious nervous shock to some sensitive children while it may not to others." Again, it is probably true that the emotional reaction will be somewhat different for different children. But, as I have stated elsewhere,* my own experience with this test does not reveal any grounds for objection to it on this score. Binet† replying to the same criticism made by Whipple‡ says: "Our young Parisians laugh at them." Indeed, it seems difficult to understand how the nervous shock to a child could be so great that he would fail to see the absurdity in the following, for example, if he were able to see it otherwise: "Yesterday they found on the fortifications the body of an unfortunate young girl cut into eighteen pieces. They believe that she killed herself." I turn to Dr. Ayres' second criticism.

2 Tests VII, 8, IX, 2 (naming pieces of money) IX, 1 (giving date) IX, 2, (naming days of the week) IX, 3, (making

*Binet and Simon's System for Measuring the Intelligence of Children. Journal of Psycho-Asthenics Vol. XV, 1911. Foot-note, P. 84.

†Nouvelle Resherches sur la Mesure du Niveau Intelligence chez les Enfants D'Ecole. L'Annee Psychologique, 1911. Foot-note, P. 145.

‡Manual of Mental and Physical Tests. Baltimore, 1910. Foot-note, P. 509.

change, nine cents out of twenty-five) and XI, 1, (naming months of the year) come under this criticism. These and others have been criticized on the same grounds by other authors. It is said that they test acquired knowledge rather than intelligence, and the former is dependent on more or less accidental circumstances of environment. The answer involves a number of considerations, and views connected with them are not yet all entirely clear. In the first place, there is probably not a single test in the whole system that does not in some manner involve acquired knowledge or acquired ability. For mental functions (discrimination, memory, attention, will, etc.) can express themselves only through such acquisitions. But the tests are based on the assumptions (1) that certain kinds of knowledge and abilities must await the development of the mental functions involved in their acquisition and that these cannot be affected so much by environmental differences; (2) that in other instances the environmental conditions for acquiring certain kinds of knowledge and abilities are so uniform that we may assume that practically every child will acquire them if he has the mental capacity to do so. Binet and Simon discuss these assumptions in connection with some of the tests and admit that in some cases in these tests no conclusion is to be drawn from the result of these particular tests alone, because of the effect of possibly an unusual environmental condition. If in some tests the child passes, we are to suspend judgment because his success may be due to specially favorable environment. But if he fails in these it shows lack of development of intelligence because environmental conditions are assumed to be uniform and favorable enough for every normal child to acquire the knowledge in question. If in certain other tests he fails, we are to suspend judgment because his failure may be due to specially unfavorable environment. But if he passes in these it shows the development of intelligence, because such development of intelligence is involved in the acquisition of the knowledge in question. Now, it would be difficult to decide off-hand in any given instance whether the intelligence is or is not tested by determining the presence and nature of a certain kind of acquired knowledge. But unless we

are prepared to disprove the underlying assumptions, implied and expressed, we cannot criticize these tests on the grounds merely that they determine acquired knowledge and not intelligence. They aim to test intelligence through acquired knowledge. Without resorting to the empirical facts which show that the system of tests is not so seriously affected by this or other sources of error as to give on the whole very incorrect results, Dr. Ayres' criticism here may be partly answered further by pointing out the unquestionable fact that the low grade feeble-minded fail to pass these simple tests of supposedly merely acquired knowledge that apparently might vary with different environmental conditions, although their greater chronological ages and environmental opportunities have been many times over what any normal child requires to learn to pass them readily.

3. In the 1908 series, which is under discussion, there are two tests (VIII, 1, and XI, 5) that involve the child's reading, three, (VII, 3, VIII, 5, and X, 3) in which he has to write, and four, (V, 2, VII, 4, XIII, 1 and 2) in which he has to make simple drawings. The point in question here is only a special instance of what is discussed under the second criticism—tests influenced by acquired knowledge—and the same general answer applies. But it is to be added that some of these are avowedly tests directly of the process involved in the motor acts of writing or drawing, while others involve these motor acts or reading, only incidentally, and are used here as a means of expression of other mental functions that the tests aim at. The latter are used for chronological ages quite beyond the point where the average normal child acquires the ability of these motor acts themselves. This distinction should be considered besides several other matters before applying the general criticism to all the tests of this kind. Test VIII, 1, is on the ability to read a certain passage, and of this the authors say that no conclusion is to be drawn if the child fails, but if he passes it shows his intelligence through the fact that he has been able to learn to read. Test XI, 5, is on the ability to make sentences out of groups of words mixed up, which the child has to read, not on the ability to read. It should need no discussion to make clear that the results are to be used

in the same way here as in Test VIII, 1. Test VII, 3, is on the ability to copy a simple written phrase so as to be legible and thus involves only the initial stages of learning to write. VIII, 5, asks the child to write a simple phrase from dictation and the criticism is valid here in part, if anywhere. In X, 3, the child makes a sentence in which he uses three given words. The authors' directions are that the child write the sentence, but the test is not dependent on this ability to write, since he may be required to give it orally, if he cannot write, without altering the essential nature of the test. Dr. Ayres probably includes the tests involving drawing in his criticism, since he mentions seven while there are only five that involve reading or writing. In V, 2, the child copies a square, in VII, 4, he copies a diamond, and in the other two he draws simple forms the nature of which he has to figure out in the test, which part constitutes the test. In the first two, the processes involved in drawing are themselves directly tested and are so simple that the normal child can pass them at an age before he has had any experience in drawing of any consequence. And that training does not seriously increase the ability to make these drawings when the necessary mental development is not present, is shown by the fact that low grade feeble-minded cannot pass these tests irrespective of their greater chronological ages and more opportunities to learn this. In the other two there can hardly be any question as to the ability to make the drawings if the child is bright enough to give the occasion to give the thirteen-year-old test.

4. The tests in question here are criticized as having only a "remote relation to the ability to cope with the problems of life. The simpler of them can be successfully passed by a gifted parrot; the more difficult ones recently proved beyond the ability of a university professor tested by the writer." The simpler ones referred to are Tests III, 2 and 3; the more difficult ones are XII, 1 and 3. The former are based on the authors' observations that the normal child acquires several things in a quite definite order. The child first learns to understand our gestures and inflections of our voice; next he understands the spoken word; next he acquires the ability to repeat words spoken to him, and last the

ability of spontaneous speech and to name objects. These simpler tests aim to determine whether the child had acquired the ability to repeat things at all, rather than the ability to repeat a certain amount from memory. The question whether certain lower animals even can do as much is besides the point, and the ability to cope with the problems of life hardly comes in for consideration for three-year-old children. The value of the tests depends on whether the authors' observations on which the tests are based are correct or not. The more difficult tests referred to are on the amount that can be remembered on one hearing and on the ability of a brief concentration of attention that is involved. The system of tests rests on the assumption that the mental functions essentially involved in what we call intelligence are fairly well developed by the age of thirteen. If we turn to the results of the numerous memory studies for the different chronological ages we find that this assumption is substantially correct for the particular functions tested in the present kind of memory test. The average child at this age will do approximately as well as the average adult, but with a considerable individual variation for both adults and children, due to causes not yet fully understood. One is therefore not surprised that Dr. Ayres should find a university professor unable to pass the twelve-year-old test. In one way it is in favor of the test rather than against it; it indicates, at least, that the functions tested are not seriously affected by exceptionally long and special training.

5. The tests indicated here are spoken of as having strikingly "little relation to anything the normal person has to do in the ordinary day's work." Two only are mentioned for illustration. Test VIII, 4, counting backwards from twenty to one, and XIII, 2, drawing the figure of two juxtaposed triangles. Of the first, he says that it "is one of the rarest things most people are called on to do", that to teach such a task to children is "educationally vicious", and that to include such a requirement in a test of intellectual ability is at least "questionable". The import of these remarks are not entirely clear to the present writer. For from the previous discussion it is evident that we would not want to follow the rule of making tests of intelligence out of

tasks that people do frequently in everyday work or that are taught to them in the schools. This would bring in directly and constantly the effect of environment and acquired knowledge. In connection with the second, he notes that, "so far he has failed to find anyone able to describe the resulting shape" as is required in the test. I might reply with equal emphasis that I have found no normal adult that could not pass this test. Dr. Ayres surely cannot have given this test a very extensive trial. His result simply shows that there is no perfect correlation between this individual test and intelligence. But such perfection is not claimed for any of them. In what other ways tests of this sort might be objectionable is not pointed out.

6. Two tests, XI, 4, and XIII, 3, of the fifty-three, involve giving definitions of abstract terms. To me this does not seem an unreasonable emphasis on this sort of test. They are objected to further because such definitions are too difficult; even normal adults with the aid of a dictionary cannot find satisfactory definitions of the words chosen in these tests. I think Dr. Ayres has again somewhat misunderstood the aim of these tests, and what the authors intend should be accepted as satisfactory definitions. The tests do not call for definitions logically faultless. They aim to determine whether the child is capable of grasping abstract meanings, and any reply that shows this is accepted. Again, the authors' discussion and illustrations of satisfactory and unsatisfactory definitions should make this matter clear.

Dr. Ayres next takes up the criticism of two sets of facts in favor of the tests. (1) "They have won rapid and wide-spread use and endorsement among hundreds of practical teachers and workers with children." This, he thinks, is due to the fact that the tests grade children according to mental ages, a scale that is at once definite and universally understood. (2) The results with the tests obtained by the authors and by Dr. Goddard on large numbers of normal children show that the mental ages as determined by the tests and the chronological ages coincide or vary only by a year in the vast majority of instances. Dr. Ayres does not agree with Dr. Goddard's conclusion from this result that it is a proof that, on the whole, the tests give an accurate

measurement of mental development, because he finds that of 14,762 public school children passed through the first seven grades, the vast majority did so in seven years, with the numbers that took more or less time to complete these grades decreasing rapidly to zero. He argues that if the former result with the tests is a proof of their accuracy, then this is equally a proof that "the public school systems and courses of study are correctly adjusted to the abilities of their pupils," and that if this were true we would have less need for tests, because the public school system already furnishes the test of the children's intelligence. The reply to this argument and criticism is that the first part of it is entirely correct. On the whole the public school systems and courses of study are correctly adjusted. The practical coincidence of the two kinds of results is a further corroboration of the correctness of Dr. Goddard's conclusion as to the tests, not evidence against it. In the second part of his argument, Dr. Ayres seems to forget that although the tests and public school system might give equally accurate results on the mental status of a child, it takes about an hour with the tests, and several years with the public school system method to decide this in any given case. What the results referred to with the tests do not show is what particular individual tests in the system are poorer or better than others. Dr. Goddard would have gotten the same kind of frequency distribution curve if all his children tested had been just average children and the system of tests had been sufficiently inaccurate to give occasional errors of a year or two in the mental ages. In this event, also, we would expect that the smaller differences in mental and chronological ages would occur most frequently and the larger differences less frequently.

Dr. Ayres' criticisms are apparently not based on his own experience in any extensive use of the Binet-Simon tests, but, as he says, are the result of "his own attempts to discover ways in which they may be improved, together with ideas secured through lengthy discussions of their application with Mrs. Louise Stevens Bryant, of the Psychological Clinic of the University of Pennsylvania." His general conclusion disagrees with those who have had such experience. They are largely the result of an at-

tempt at an internal analysis of the nature of the tests themselves. Criticisms of this sort have their value as a means of calling attention to problems that may need to be solved, but the literature on the Binet-Simon tests has by this time abundantly shown that for the most part they cannot be accepted on the basis of any mere logical plausibility, without any empirical testing out. To the present writer, Dr. Ayres' criticisms seem to come largely from a misunderstanding as to what the different individual tests aim at, and of the mental processes involved in them. The former might have been largely obviated by a more careful consideration of the authors' original publications, and the latter by a careful and extensive use of the tests themselves. There is, especially, a general impression that the authors meant that the results with each individual test will always come out just right, which impression Dr. Ayres seems to share somewhat. If this degree of perfection were attained, only one test of mental age for each chronological age would be necessary, where the authors use from four to eight, and besides point out in many instances what proportion of correct results the test has been found to give. It is therefore, not a fair criticism to point out that this or that individual test often gives wrong results. Probably not a single test in the whole system is free from such objection. In general, this article reminds one that it is easy to make criticisms and difficult often to clearly disprove them. But even so, the validity of merely possible objections is not thereby established.

THE EXPERIENCE OF THE GERMAN ARMY WITH THE DEFECTIVES AND THE FEEBLE-MINDED*

In 1892 Schaeffer, as a result of his extensive studies of moral defectives, called attention to the important role that the defectives and mentally diseased play in the German army. His recommendations have since been embodied in the German regulations covering this question. In regard to the relations of the feeble-minded to military life Schaeffer (1) says that they are especially important in the following connections:

1st. They are the object of mistreatment at the hands of other soldiers.

2d. They are repeatedly in conflict with discipline and military law.

3d. They are notoriously intolerant of alcohol, and when under its influence frequently commit military crimes.

4th. They are emotionally unstable and irritable. Especially are they characterized by unreasonable outbreaks of temper and of assaults upon their superiors.

5th. They frequently commit suicide. The defective does not appreciate the value of life and when dissatisfied determines to make an end of himself. We know that among primitive people there is very little knowledge of their inner or intellectual life, and whatever happens to them is referred to some external influence in their environment which they are constantly propitiating. In much the same way the defective views everything from an objective standpoint, and when he is unfortunate he is inclined to end it all by self-destruction.

Man has advanced from the mere ability to provide for his physical wants to the ability to think and reason and finally to the ability to understand and adapt himself to his environment. It is natural that we should still find some members of the race not reaching this higher plane and we may find their progress

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stopped at any point in their development. Schaeffer lays especial stress upon the moral or altruistic side and its faulty development. They fail to grasp such ideas as duty, obedience, truthfulness, patriotism. This may be associated with an average intellectual development and must be especially looked for if we expect to discover it. Because of the importance of this subject, Schaeffer therefore advocates a special knowledge of such subjects among military surgeons that the enlistment of such persons might be prevented, and that if already enlisted they might be eliminated before they were a source of injury to themselves or the army.

The subject seems to have attracted only passing notice in the German army after this until in 1904 and 1905 E. Schultze (2) of Bonn published the results of a careful study of 100 insane military prisoners that had been under his care in the previous five years. As to preventing their enlistment he concludes as follows:

1st. All previous mental disease should be a bar to enlistment and hence reported to the proper authorities.

2d. Some psychoses do not reach an institution—e. g., maniac depressive insanity of a mild character. A previous delirium tremens and a prolonged fever delirium show a defect in development. The family, the town authorities, or the hospitals should be able to furnish evidence of these facts.

3d. Those not reaching the middle grade or fourth year of the public schools, as well as those sent to the schools for backward children, should receive especial attention. A life history written by the soldier will reveal a great deal to the careful observer. Besides intellectual defects and the slovenly writing of the defective, we know that the defective is, naturally, a hobo—wandering from one pursuit to another.

4th. The military record of the soldier reveals the degree in which he succeeds in adapting himself to military life. The mentally defectives are disobedient, neglectful, and lazy in spite of frequent punishment. They tire of instructions very early. They admit that they feel incompetent. They lie and exaggerate and are irritable. Fifty per cent. of Schultze's cases were accustomed

to the misuse of alcohol. Ninety per cent. of the defectives had been previously punished in civil life and 50 per cent. of them had been guilty of "desertion" or "absence without leave."

February 17, 1905, a commission (3) appointed by the war department, under the leadership of Prof. Ziehen, considered the subject of the mentally defective and the mentally diseased. From a study of 1,190 cases they found that the most frequent mental abnormalities were the following:

1st. Congenital weak-mindedness in its various grades and manifestations.

2d. Acquired epileptic weak-mindedness.

3d. Dementia precox.

4th. Pyscopathic or degenerative psychoses and hysterical manifestations.

After discussing fully the value of different means of examination, they conclude as follows in regard to the means necessary for their early recognition:

A. Beim Heeresergaenzungsgeschäft (at the time of making up the lists of accepted recruits.)

1. Consideration of the information in regard to previously being in an institution for the mentally abnormal, or any other facts of this sort of psychiatric importance.

2. Consideration of any information as to their standing in school.

3. Consideration of their success in whatever occupations they may have had and the record of previous punishments.

4. The questioning of their associates in selected or suspicious cases as to any abnormality noted in their previous lives.

B. Bei der Einstellungsuntersuchung (the examination at the time they are installed in the troops.)

Besides the physical examination the surgeon should examine the intellectual status in the following respects:

1st. All are to be especially considered who—

a) were marked for further consideration in the previous examination.

b) had been previously often punished and were noted as not up to the recruit standard—e. g., arbeitssoldaten.

c) have many stigmata of degeneration or very bad heredity.

d) appear noticeably defective.

2d. In suspicious cases information is to be sought from their homes.

3d. Systematic examination of intellectual and moral spheres in suspicious cases.

4th. Simulators must be searched for.

5th. Cases not clear to the surgeon should be placed in hospital for observation.

C. Während der Dienstzeit (during their enlistment period—2 years in Germany).

1st. Continued observation by the troop surgeon of those who—

a) have bad heredity, many stigmata of degeneration, or a record of many previous punishments.

b) have suffered a severe head injury.

c) report on sick report more often than the others and do not appear sufficiently sick.

2d. The surgeon must secure that officer and non-commissioned officer, who being in charge of such men give them especial attention.

3d. Surgeons should explain that great awkwardness, difficulty in learning, and peculiarities of conduct may be due to pathological conditions.

4th. Attempts at suicide should always lead to a period of observation in the hospital.

5th. Before soldiers are sent to prison or the companies for second-class or defective soldiers (Arbeiter-abtheilung) they should be carefully examined from a psychiatric standpoint.

As an example of a general comparable method for examining the intellectual status the following is recommended by this German commission:

1. When and where born? How old?

2. How many inhabitants in your native town?

3. Near what river, mountain, or larger city is it situated?

4. How long have you been a soldier?

5. What is your regiment?
6. Color test as to ability to distinguish same.
7. Price of loaf of bread? Street car ticket?
8. How many classes on railroad train? Which the cheapest?
9. How does one travel to America?
10. From what do we make bread? Where do we get the flour?
11. When are the leaves withered? When is harvest? When Christmas?
12. How many days in the week, the month, the year, leap year? Name days and month.
13. Largest river in Germany.
14. How many pennies in a taler (3 marks)? $\frac{1}{2}$ taler?
15. If you buy 1.67 Mk. of provisions and give the merchant 1 taler, how much change do you receive?
16. Color of a ten-penny stamp? 5-penny stamp?
17. I think of a number which multiplied by 3 gives 9. What is the number? and similar questions.
18. What is the difference between a ten-cent piece and a mark? a tree and a bush? a river and a stream? a basket and a chest? Lie and error? etc.
19. Give examples of thankfulness. Of envy. What is the opposite of bravery?
20. Give a simple story illustrating the above and ask an explanation.
21. Have him repeat,
 391
 4725
 85376
 921387
22. See if he can repeat question No. 15 after 5 minutes.
23. To give names of other soldiers and officers? To repeat conversation of previous day.
24. Have him count up the days and months in a year.
25. Show him a simple picture for a time and then let him describe it.

26. Tell him a short story and see if he can repeat it.

27. Ebbinghaus test.

This morning I — and — my hands and — before — went — to—. I then — a cigarette and — for — call. (Blank space to be properly filled in by the person being examined. May vary as seems best.)

28. Masselon test: e. g. given words hunter, gun, rabbit, field to make a sentence containing these words. May vary as seems best.

The latest and most complete study of the subject is by Dr. Theophile Becker, Stabarzt. (4) He bases his conclusions on the cases under his personal observations at Strassburg from 1901 to 1906. From 1875 to 1904 mental disease and mental deficiency were classed together. During the $3\frac{1}{4}$ years before 1875, when they were classed separately, he found that there were 372 classed as defective and 111 as having psychoses. That the standards were probably different is shown in the fact that in the year 1905-1906 the relative number of each class was 305. During the period 1873 to 1906 the number of mental ailments in the army increased from 0.21 per cent. to 1.10 per cent. This increase may be explained partly from the increase in the army (298,876 in 1873 and 531,735 in 1906) and the general increase of such cases among the whole people. But we must also recognize that the German soldier now serves only two years and is required to know more than formerly, while the knowledge of psychiatry has greatly increased among German military surgeons.

Becker also shows that the records of the years from 1882 to 1906 when taken by periods of three each give a marked difference in the frequency of the discovery of mental ailments at different times of the year.

Evidently the majority were discovered soon after they joined the troops. During the year 1905-1906 the cases were classed separately and we find even more striking results. Of a total of 305 cases of defectives, 146 were discharged in the fourth quarter, 92 in first quarter, only 67 in the last half of the year. Stiers (5) says three-fourths of the cases of suicide and insanity are discovered in the first six months of service. It is also interesting

to note that in Germany the asylums received 420,718 during the period 1880 to 1891, of whom 13.55 per cent. were classed as imbeciles. Becker points out further that the feeble-minded were often discharged in a period of excitement and hence were counted among the psychoses.

While Becker's figures apply to Germany, the same facts no doubt hold true for all other countries where military service is compulsory and all males of a certain age are examined with reference to their fitness for service. To a lesser degree it must also be true for those countries where service is voluntary, for it is well known that the defectives are attracted by the romance of the service and that the families expect the army to reform them if anything can.

Gross defects of development in the motor sphere are so evident that they will probably be eliminated at the entrance examination. Defects in the intellectual or moral spheres are much more difficult to establish. Even in Germany, where the impartial evidence of the town authorities, the teacher and the minister, as to the previous life of the candidate is available, they find it exceedingly difficult to establish the fact. The following points of investigation are mentioned by Ziehen (6), Stier, Becker and others as requiring especial investigation.

1. **Heredity.**—While Becker found defective heredity in only 50 per cent. of his cases, Stier insists that "psychoses among soldiers are in direct proportion in the heredity defects." In our own country it is found that a visit to the locality and intensive study show bad heredity in nearly every case of mental abnormality. In tracing back for several generations the heredity of the inmates of a New Jersey institution for feeble-minded, it was found that only a few couples were responsible for the defectives in this institution and that they were all thus more or less closely related. At Gowanda and neighboring State Hospitals in New York it is known that at least 100 families from that neighborhood have two or more members in these institutions. It is evident that the influence of heredity is greater than we can demonstrate. From the Mendelian Laws, however, we know that bad heredity may exist without all the children being affected.

Hence, even this information can not be used for the exclusion of every case. But Stier says that it deserves at least a more important place than we give heredity in pulmonary tuberculosis.

2. **Stigmata of Degeneration.**—Every one agrees that these are important only when they are multiple. Becker says that when we find these multiple bodily stigmata we shall also always be able to demonstrate psychic degeneration. The following special stigmata are mentioned by Becker and can be confirmed from a study of a large number of cases by the writer at St. Elizabeth Hospital:

(1) Abnormal smallness of cranium.

(2) Misproportion of size of cranium and of facial bones as well as of whole body. This is shown less in the smallness of circumference than in the relative smallness of the longitudinal diameter and the height from the level of the ears.

(3) Low narrow retreating forehead with projecting eyebrows—a truly simian type.

(4) Hydrocephalic type where the circumference of the base is several centimeters less than the circumference 2 or 3 centimeters above this. The upper part is pushed out as result of increased intracranial pressure while the base is fixed.

(5) Asymmetries and irregularities are generally due to premature synostosis of bones of cranium and consequent bulging of other parts. This is the result of a pathological process.

(6) Bodily and sexual development are often markedly retarded in these cases. Many times Becker saw men of 22 or 23 years with childish bodily development and small high voices.

3. Psychic development of these cases is characterized by a lack of harmony and does not correspond to the bodily development. We find defects of intelligence, memory defects, lack of ability to reproduce ideas or to do connected thinking, judgment defects, etc. They have very little power of attention and tire very easily. During the early part of the interview they will give correct answers and later manifestly incorrect answers. Two general types are found, the torpid stupid class and the excitable irritable class. Naturally the degree of the defect shows all possible variations.

4. Their previous history shows that they never measured up to a reasonable standard for their age and position in life. Their birth may have been complicated by trauma. They may not have walked and talked until much older than the average child. They may be the oldest in the class or not be able to keep up with the others in school. They rarely pass beyond the fourth grade. They change occupations frequently. They form the large part of the juvenile criminals. Schultze's figures show that from 55 to 65 per cent. of the criminals of Germany are 18 years or less of age. Hence the defective frequently has been punished one or more times for offences.

Becker admits the difficulty in establishing any hard and fast lines for these defectives and says we must be governed largely by their social usefulness and their teachableness. In a few cases he felt that the only possible way to decide the case was to return it to the troops for another practical test. But it seems reasonable that if we bear in mind the points adduced in this paper we shall be able to determine the facts in nearly all cases and save not only a great expense to the country but also a great deal of suffering to the individual. The prospective growth in our own army means that we shall see more and more of this difficult question that the Germans are dealing with. Because of the benefit of their experience let us hope that we shall be better able to deal with the problem.

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BOOK REVIEWS

THE FEEBLE-MINDED—A GUIDE TO STUDY AND PRACTICE.
—E. B. Sherlock, M. D., B. Sc. Lond., D. P. H. MacMillan & Co.,
Ltd., London, 1911.

This is an illustrated volume of 327 pages with an introduction by Sir H. B. Donkin, M. D. The author discusses his subject under seven heads, as follows: I, The Nature of Mind; II, The Basis of Mind; III, The Feeble-Mind; IV, The Basis of the Feeble-Mind; V, The Cause of Feeble-Mindedness; VI, The Varieties of Feeble-Minded Persons, and VII, The Handling of the Feeble-Minded.

Chapters I and II are well indicated by their titles and deal largely with speculative problems of psychology. In Chapter

III. The Feeble-Minded, the author summarizes the general characteristics in the statement, "A paucity of presentations, an imperfect memory, anomalies of the affective process and limitation of the faculty of attention are the groundwork of mental incompetence." Considerable emphasis is placed upon "ill-regulated instincts" and the abnormalities of expression are discussed at length and the terms used for them explained. In chapter IV, The Basis of the Feeble-Mind, the pathology of the condition is set forth, and the author takes for granted, as he must, it seems to us, that the "existence of mind is conditioned by the existence of nervous tissue," and notes "that the units of nervous tissue are cells with processes" and that "the health of the nerve cells is dependent, to an extent which we cannot as yet exactly define, on the integrity of cells in other parts of the body."

He summarized as follows: "The physical factors of feeble-mindedness are to be sought then in the following fields: (1) The nature and relations of the nerve cells. (2) The nature and relations of non-nervous elements."

The original contributions to this subject from postmortems are derived from the study of six groups of cases. (1) A group of 100 male idiots and imbeciles between the ages of sixteen and forty-nine, (carefully excluding all cases diagnosed during life as general paralysis.) (2) A group of one hundred males similar to those in (1) but made up of fifty epileptics and fifty non-epileptics. (3) A group of males and females (number not given) for whom the autopsy records were incomplete. (4) A group of two hundred and fifty males and two hundred and fifty females, between the ages of five and sixteen. (5) A group of 100 males, sixteen to forty, on whom cranial measurements were made. Besides a discussion of the interpretation to be put upon brain weight, and the absence of imperfect development of cells, in their respective "levels," he reports in group (1) a range of weight from 55 oz. to 15¼ oz. and a mean of 42 oz.—as compared with Hick's finding of 49 oz., as the average normal. He states, "An obvious gap in a layer of nerve cells, such as some of my preparations have shown, affords strong evidence that cells once present have been replaced by something else (neuroglia)." Dis-

tinct evidences of cell degeneration were found in some of fifteen cases stained. The author, however, does not state whether these cases were adults or children—a point it seems to us of importance. Pigmentation of cells was noted, though not in the cortex. In comparing the weights with those of brains from the insane, he concludes, "We get therefore no corroboration of the view that in idiots and imbeciles the cerebrum is relatively less developed than in the insane, indeed the evidence points in the opposite direction." Asymmetry of the hemispheres is notable, especially in epileptic idiots and imbeciles. Other pathological conditions, such as non-development of one cerebellar hemisphere, abnormalities of convolutions, lesions of the inter-cranial vascular system, etc., were noted. The author warns the reader against the popular notion that the stigmata are diagnostic of feeble-mindedness. Much of interest is found in this chapter but the keynote of the present situation is struck in the closing paragraph: "The investigation of the physical substrata of aberrant complex mental processes presents much greater difficulty than the recording of abnormalities of the sensory or motor apparatus, which is all that most workers among the feeble-minded have opportunity for. All departments of biology-embryology, normal and morbid anatomy both human and comparative, physiology and psychology must be called upon if further progress is to be made, and it is a dawning perception of this fact which is the most significant as well as the most hopeful feature of modern tendencies in the investigation of the pathology of mind."

Chapter V presents nothing especially new in causation but analyzes the situation with reference to eugenics and the advantage of knowing pedigrees. Some of the theories of heredity are discussed including the Mendelian, and the conclusion is reached that heredity is the most frequent factor.

Chapter VI is rather disappointing in that the author clings to the pathological basis for classification as tenaciously as did Dr. Ireland whose scheme, however, he regards as very unsatisfactory. He discusses, besides Ireland's, those of Collier, Voisin and Weygandt, and that of the Royal Commission. He dismisses Wildermuth, who attempted to classify by comparing various

grades of development, by the statement, "This attempt is chiefly of interest in that its failure serves as reminder of the complexity of the etiological problem." The writer is among those who believe that the principle herein stated presents the one possibility of a satisfactory classification.

Neither Seguin's, Barr's nor the American Association's classification is referred to. His requirements for a satisfactory classification are admirable. They are (1) "It should be based on matters of fact rather than of opinion. (2) It should be complete and exclusive. (3) It should have, at any rate for groups at the same level, a constant determining factor. (4) It should be based on definitions of universal acceptance. (5) It should be authoritative." To all these we can heartily subscribe and it seems to the writer that the classification of the American Association for the Study of the Feeble-Minded more nearly meets these requirements than any other proposed. The author proposes descriptive terms. (a) Ateleiotic, (b) Mongolian, (c) Microcephalic, (d) Macrocephalic, (e) Cretinous, (f) Epiloica, (g) Plegic, (h) Progressive, (i) Residual. Each of these groupings will supply instances of three grades of mental defect which may be called respectively, idiocy, imbecility and weak-mindedness. The "common grammatical form for the terminology" certainly obviates that defect of Ireland's groups. Without discussing these groupings, most of which are well recognized (though "Ateleiotic" and "Progressive" are new) it seems to the writer that their value is descriptive and not organic in the classification. The term feeble-mindedness is used as in America generically, and weak-mindedness specifically for the upper third (for which the term Moron is used by us).

The discussion of "moral feeble-mindedness" is a valuable contribution and his discussion of the relation of the acts involving nutrition and reproduction, to those employed in their inhibition, in the interest of society, exhibits the difficulty in theoretically separating the group representing it too completely from the other feeble-minded.

Chapter VII. Permanent custodial care and industrial as well as farm colonies, are advocated—the inexpediency of board-

ing out indicated, an elaborate scheme for institutional development and organization outlined. Education for suitable vocational employments is advocated.

Taken as a whole, this work is the result of a scholarly study of the subject and its conclusions are based upon an extensive experience with the class described as well as correlated subjects. It is full of interesting data, very readable, well supported by authoritative references and cannot but be a source of inspiration to any one in quest of knowledge concerning the feeble-minded.

ROGERS.

DER GEGENWAERTIGE STANDT DER METHODIK DER INTELLIGENZPRUEFUNGEN (MIT BESONDERER RUECKSICHT AUF DIE KINDERPSYCHOLOGIE.— E. Neumann. Zeitschrift für Experimentelle Padagogik, 1910, Pp. 68-79.

This is a keen analysis in rather condensed form of tests of intelligence by the most prominent German educational psychologist of to-day. It gives not only a brief outline of the "present status of tests of intelligence," as expressed in the title, but also a critical and constructive interpretation of principles involved. He observes that these must necessarily vary according to the aim with which they are used. According to this aim they fall first into four large groups. (1) Tests of intelligence for the psychiatrist. The psychiatrist wants to determine characteristic mental traits of definite disease complexes, and for this he needs tests of acquired knowledge as well as of mental capacities. Tests of the former kind, however, always meet the difficulty that comes from the fact that there is but little acquired knowledge that we can safely assume all normal adult persons to have in common. The efforts of Ziehen and his pupils to find such in arranging their tests of this acquired knowledge have been rather futile. (2) Tests of intelligence of abnormal children. These must differ from the first in that (a) they aim to determine symptoms of mental diseases that develop in later life, especially feeble-mindedness, and (b) because children have so little acquired knowledge and their mental capacities are so little developed that tests for adults do not apply. (3) Tests for the

analysis of the intelligence of normal adults. The object here is to determine (a) the average degree of intelligence and the range of variations within the limits we call normal, and (b) the qualitative individual differences, such as the types of imagination, of memory, of attention, etc., together with their correlation. (4) Tests of intelligence of normal children. All the problems of the second group are involved here. But there is here the additional problem of determining the standards of mental capacity for each year of the child's age which characterize the average normal child at each age.

Viewed from another standpoint, all these tests and problems fall into two other groups of methods of testing intelligence. (1) Tests that aim at the analysis of the total endowment of all the intellectual processes, and at the determination of the ways of deviation of an individual from the average. This is the ideal, but the time required to accomplish it for large numbers makes it impractical. (2) Tests of only one or few mental functions from the results of which we may conclude as to the "general intelligence." Because of their great practical significance only the latter class are considered further. These fall again into two classes. (a) Psycho-analytical tests of some simple function, such as sensory discrimination, which involves the higher mental functions. (b) Practical tests on complex activities of every-day life or school work which have been empirically found to be tests of intelligence. Both kinds of tests make two important assumptions. First, that in every mental activity every aspect of consciousness is more or less involved, so that we can draw some conclusion about all mental functions from the results of any mental activity. Second, that definite correlations exist between the individual mental functions on the basis of which we may conclude from the development of one as to the development of the other. The first and most important problem connected with tests of intelligence is to determine how far these two assumptions hold true, for evidently both hold true in part and neither entirely. For these reasons the value of the tests of intelligence have come to be questioned. On the other hand, because of their simplicity, the little time required to give them, and

the approximate measurement of intelligence that they give they are indispensable. We must look about for improvements, and in connection with this the author makes two general suggestions. (1) The intelligence is never tested with one or a few tests, but with a series of tests (like those of de Sanctis and of Binet) that are so chosen that one may be certain to test, at least, the main functions of intelligence. (2) We should give up the attempt to test general intelligence and aim only to test the higher intelligence. By the higher intelligence is meant the "mental assimilation" (*denkende Verarbeitung*) of given impressions and ideas, together with the characteristics of speed, thoroughness and comprehensiveness. These series of tests may be chosen in one of several ways. (a) We may use only tests of mental functions, the psycho-analytical tests already mentioned. Or (b) we may include tests of acquired knowledge. This may be limited to such knowledge as all children may be assumed to acquire outside of school influences, or it may include tests on their school performances. The Simon-Binet tests test mental functions, and both kinds of acquired knowledge. But the latter is influenced by many things other than the intelligence, and the tests on mental functions alone are in a high degree independent of accidental individual differences due to school and parental training. If tests of acquired knowledge are to be included one must make sure that he does not test this rather accidental, acquired knowledge, and that they be used only for children not over four years of age, for beyond this age there is no knowledge that may not be acquired through school or parental training. As regards the tests of the higher intelligence, they must be chosen so as to test all its characteristics. These are mainly that thought works always with relatively abstract factors, concepts, that it is purposeful, being ruled by a guiding idea, which fixates the attention, and that the results of thought then depend on the perseverance of this guiding idea, the readiness with which other ideas arise, and their wealth and variety. To test these several characteristics the following seem best adapted. (1) Definition of abstract words. (2) Learning and immediate recall of abstract words, compared with (a) learning and immediate recall of nonsense syllables.

and (b) meaningful words. (3) The recognition of like characteristics in objects mixed in among other objects. (4) The comprehension of a simple classification, as figures or objects of the same class when the characteristics of the class have been explained. (5) Crossing out all of several given letters in a text. The arrangement of the members of a group of sensory impressions according to a given plan. (7) Comparing two things from memory. (8) Arrangement of weights in order of weight. (9) Making sentence with given words. (10) Giving the essentials of a story heard.

KUHLMANN.

REPORT OF COMMITTEE ON MEDICAL INSPECTION OF SCHOOLS—*Journal of American Medical Association*, 1911. Pp. 1751-1757.

This report, which was read before the Section on Preventive Medicine and Public Health of the American Medical Association at Los Angeles, June, 1911, was prepared by a committee of thirteen California educators and medical men. It is a part of a movement in that state to provide for a medical and mental examination of all public school children of California and for the special care and treatment, medical and educational, of those found to require it. As a program for enactment it is more comprehensive in scope and at the same time more thorough and exacting in details than anything that has ever been seriously brought before the public in this country. The committee further recommends: "That steps be taken to bring about a conference of representatives from the United States Department of Education, the National Educational Association, the American Medical Association, the American Institute of Homeopathy and other national medical associations, and the Russel Sage Foundation for Child Welfare, which committee, after joint consideration of the problems involved, shall formulate and recommend alternative systems of educational hygiene which in time would be accepted as standard requirements in this special field of education."

The committee thus aims to bring about for the schools

throughout the country, provisions for the welfare of school children which many cities and school boards in different states have begun to make in part on their own initiative. It suggests, first, that the work be divided between two agencies. (1) Educational hygiene under the control of boards of education. (2) Care and control of contagious and infectious diseases under the control of the boards of health. The plans for the former are then enlarged upon, the essential features of which are as follows: (a) A staff of expert medical, and mental examiners to examine all school children at least biennially, and to give all candidates for teachers' positions a physical and health examination. (b) Courses of technical instruction in hygiene for pupils and teachers, and instruction to teachers in initial examinations of children. (c) Well-equipped laboratories and research bureaus for the systematic study of mental retardation and all exceptional children, and for the "technical training of teachers in the laboratory and experimental phases of educational work." (d) The correction of physical anomalies and removal of growth-barriers, and the adjustment of educational activities to meet requirements. In discussing the need of these examinations the committee notes the great number of more or less defective children now in the public schools, estimated at 3,000,000 out of a total of 18,000,000. Their schooling involves a cost of approximately \$100,000,000 annually, "an expense largely wasteful and preventable, to say nothing of the loss of life-efficiency." It urges the need of universities and other schools to determine by measurements and tests the norms of physical and mental development whereby the status of all school children may be determined, and mentions in connection with this the progress already made along this line in the institutions for the feeble-minded and epileptics at Vineland, New Jersey; Lincoln, Illinois; Faribault, Minnesota; and Skillman, New Jersey.

In general, the recommendations of this committee differ from those of others and what has been put into practice in some cities in the greater stress it lays on careful and thorough examinations, and on educational research. In these two respects the report is of special interest to the institutions for the feeble-

minded, for it touches on matters in which both the latter and the public schools are interested. In a number of instances in which the public schools have established special classes for backward children, careful examinations are not provided for. It has resulted, naturally enough, that many really quite feeble-minded children are kept in these special classes with the hope, of the parents, at least, if not of the teachers, that they may be brought up to normal standards by a little special effort and some adjustment of methods. More careful examinations will do away with the evils resulting from such practice. It will not only more thoroughly eliminate from the regular classes all that are really below the normal, but it will also eliminate from the special classes for backward children the very large percentage of feeble-minded. With the latter elimination the school for the feeble-minded are of course directly concerned, and if carried out would undoubtedly soon double the number of their inmates. In the establishment of research laboratories and bureaus of research for the scientific study of mental development and retardation suggested by the committee, it not only recognizes the practical value in such an endeavor, but reflects its conviction that education has reached a stage wherein conditions demand it. Several American institutions for the feeble-minded, and the Chicago public schools, notably, have put these suggestions into practice. They are both interested in the same general problems, the facts about development and retardation, and their interests are sure to come together at many points where they have heretofore had but little in common.

KUHLMANN.

UEBER DIE ASSOZIATIONEN VON IMBEZILLEN UND IHRE DIAGNOSTISCHE VERWERTBARKEIT.—E. W. Nathan. Klinik für psychische and nervöse Krankheiten, 1909. Pp. 320-379.

The object of this study was to determine whether any criteria could be found in the character of the associations of the feeble-minded that might be used as a means of diagnosis of mental defect. The experiment consisted of the usual word association test in which a word is called by the experimenter and the

subject is instructed to give the first word that this suggests as quickly as possible. The time is taken with a stop-watch. Eight high-grade morons, from nine to eighteen years of age, were chosen for the study. A special, classified list of about one hundred and fifty words was used once for each person. Wreschner's results in the same experiment with normals are taken as a means of comparison. The results are given in detail for each person. He finds both a lengthened association time and several qualitative differences. The following figures on the association time are averages taken from his summary tables. The time is given in one-thousandth of a second.

		Concrete Abstract		
	Adjectives	Nouns	Nouns	Average
Morons	3600	3000	4300	3800
Normals	2200	2000	2700	2300
Difference	1400	1000	1600	1500

This indicates a considerable difference, greatest for the abstract nouns. There is a considerable individual variation among the morons. The individual variations with Wreschner's normals are not given in this study. Among Nathan's eight morons one has a shorter association time in the case of concrete nouns than the average normal for concrete nouns. The same is true for the abstract nouns and the general averages. Several qualitative differences are next noted and analyzed in detail. These are: (1) An increase with the morons of "symmetrical" associations. These are cases in which the association word given by the person is of the same grammatical form as the word called by the experimenter. (2) Increase in "formal" associations. These are instances in which the association word results directly from some sensory characteristic in the perception of the call-word and not from any meaning of the latter. (3) Frequency of stereotyped associations, instances in which the same association word is given for several different call-words. (4) Large number of meaningless reactions. (5) Speech uncertainties and invention of false words. None of these qualitative characteristics, however, are very regular with any individual; the individual variations in these are much greater than in the association time. As a means

of interpretation of these results he points out the following possible causes: (1) Intellectual poverty, lack in wealth of ideas. (2) Defective powers of concentration. (3) Increased prominence of mere imaginative activity. (4) Increased tendency of certain ideas to persist ("perseveration of ideas.")

On the whole the study rather shows that this form of the association test is not in itself a reliable means of diagnosing feeble-mindedness in its higher grades, while apparently in many cases it would give unquestionable evidence. The correlation with degree of intelligence seems to be close enough to make it a useful test in its present form when used in connection with others.

KUHLMANN.

THIRD ANNUAL REPORT OF THE STATE BOARD OF CHARITIES AND CORRECTIONS, TO THE GOVERNOR OF VIRGINIA.—In addition to a report on institutions generally and proceedings of the Child Welfare Conference (121 pages), the report devotes twenty-nine pages to a discussion of the feeble-minded and cripples, especially the former. The spirit of Vineland breathes through the report which is vital and instructive. The board recommends custodial care of the feeble-minded and the prevention of marriage of mental defectives.

SOME INVESTIGATIONS CONCERNING THE RELATION BETWEEN CARPAL OSSIFICATION AND PHYSICAL AND MENTAL DEVELOPMENT.—Eli Long, M. D., and E. W. Cadwell, M. D., reprint from American Journal of Diseases of Children, February, 1911.

THE PSYCHOLOGIST IN THE SERVICE OF THE COMMUNITY—P. F. Lang, M. D., reprint from Alienist and Neurologist, August, 1911.

NOTES

Craig Colony, Sonyea, N. Y., has just provided for a resident dentist and is arranging for a junior assistant physician whose duties will consist in laboratory work in connection with

the pathologist. It has also just provided for a superintendent of nurses, a step in advance toward meeting the requirements of the education department of N. Y. S. In the building line, a new brick dormitory is in process of construction to accommodate sixty middle-grade male patients.

The Career of a Moral Imbecile is the title of an interesting case described, with illustrations, in the November number of the *Alienist and Neurologist*, by Dr. Martin W. Barr.



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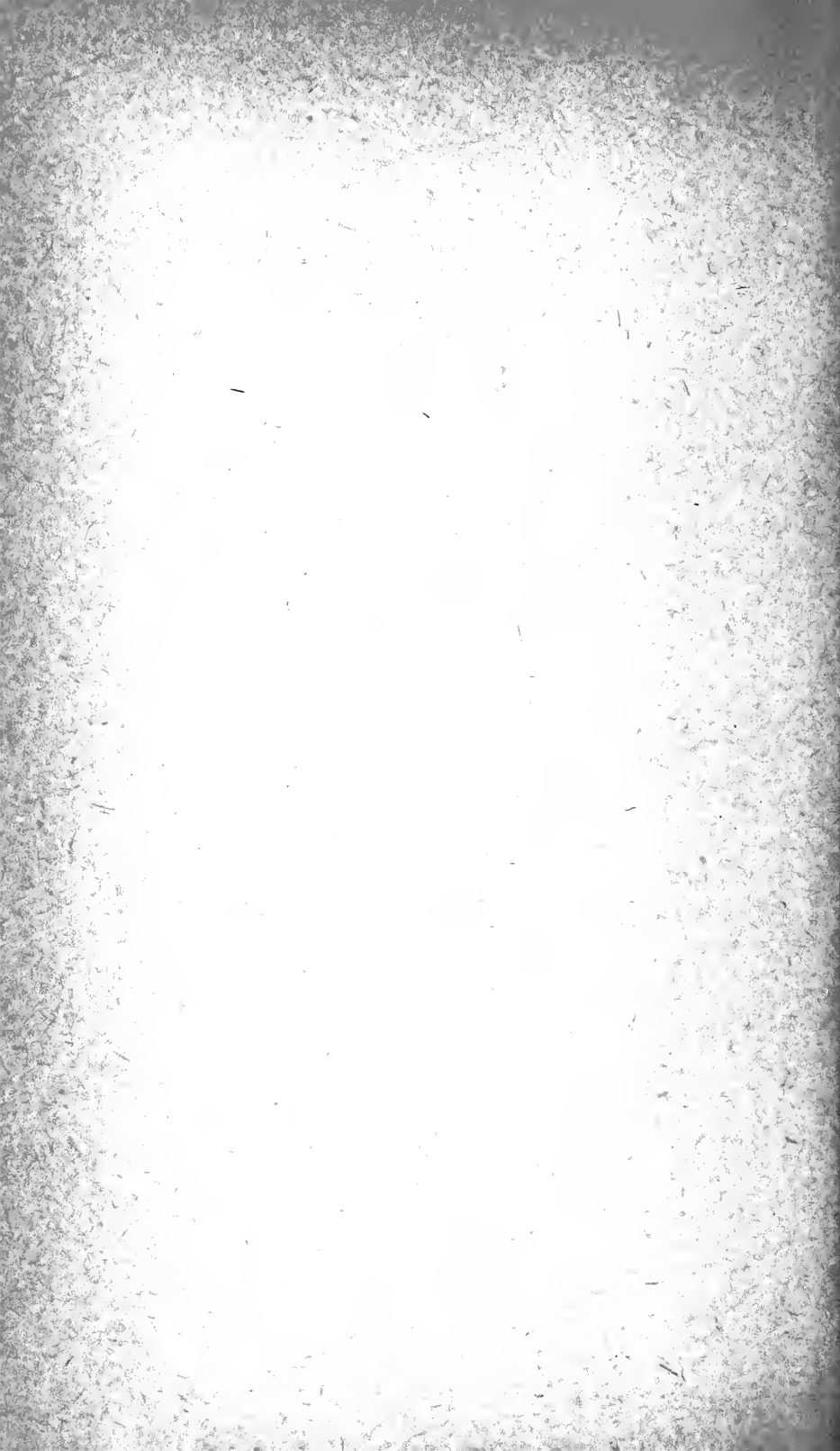
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A FEEBLE-MINDED GENIUS

BY GEORGE MOGRIDGE, M. D., *Superintendent Iowa Institution for Feeble-Minded, Glenwood*, and
WILLIAM HEALY, M. D., *Director Juvenile Psychopathic Institute, Chicago*.

Human genius of any form is ever of interest. Doubly interesting are those who exhibit special abilities above the normal range while the general level of their intelligence is subnormal. By the laity, such individuals are often regarded as wonder-workers. It has occurred to us that in cases of such marked elevation and segregation of certain faculties there might prove sometimes a rich find for the psychologist. If the structure and dynamics of the anomaly can be interpreted there might be discovered in such rising up of a lone peak of ability from a low-lying plain of intelligence, some facts of fundamental importance. Our short study, here presented, of a feeble-minded man of the idiot-savant type shows at once some value inasmuch as it exposes a quite unexpected mental mechanism underlying certain wonder-working mental feats. We do not presume to have gone to the bottom in our investigation of his mental processes, but even our short efforts show the possibilities which may lie in the study of such an individual. It may well be that the knowledge obtained from the study of anomalous mental individualities may throw much light on the normal structure and workings of the human mind.

The subject of our study has been J. K. S., a healthy, strong

man forty-one years of age, who has been in an institution for the feeble-minded since he was twelve years old. He presents no physical defects of importance. Large, well marked features, high forehead, good color. His expression is pleasant and responsive, rather inclined to the vivacious type. Very little is known of his heredity except that his mother was reputed weak-minded. He was an only child. The father died soon after his birth. Nothing is known of his ante-natal or birth conditions. The meagre history states that the deficiency was first noted when he was four years of age when it was found he had difficulty in learning to talk. Never had convulsions. Attended the public school from five to eight years of age. He was then removed on account of his own nervousness and his disturbance of the other scholars. He attended the school in the institution, learning to read and write fairly well and to do simple problems in arithmetic up to long division. He finished in the school department at his nineteenth year. He took instruction on a brass instrument but never acquired any proficiency. Always had difficulty in playing by note although he memorized some simple music. After that he began work in the shoe shop, but his work has ever been slovenly and coarse. During the summer he has worked in the orchards and in the shoe shop during the winter. He is willing but not neat in anything he does. He is thoroughly egotistical, very fond of attention and of discussion of his peculiar mental powers. He has a great fondness for writing letters, frequently addressed to the superintendent. His compositions are incoherent and extremely reiterative, usually having reference to something he wants to do; they are just such as are received by physicians in hospitals for the insane from their patients with mild dementia. For instance, a letter will be written by him, with an after-thought on an extra piece of paper, and sealed in the usual way. Then another slip of paper will be written on and closely rolled up and inserted. Finally the envelope is also written on with the same reiteration of sentiment. Our subject has talked for years about his desire to travel with a circus in order that he might see the world. However, one of the chief reasons is that he might get a chance to wear a red uniform. As

it is now he wears red cuffs on his coat and a red tie. "Red is my color." He also talks a great deal about his connection with a certain church. Pays a great deal of attention to politics, always maintaining he is a Democrat. He has been a great reader of time-tables, of newspapers, talks a great deal about the weather and is astonishingly well versed in the titles of official or governmental positions. He has probably failed mentally somewhat in the last five years. His special abilities were never made much of except by himself. He was never pushed or trained in any way.

His unique powers which have for long been known to those about him, have been demonstrated in recalling dates and occurrences and in his ability to quickly tell the day of the week upon which a given date fell. One would naturally assume from the readiness with which he performs the last feat that he had some brilliant arithmetical or calculating ability by which he accomplishes this feat, and it is about his method of doing this that our study has been centered. Tested by the Binet system (1908 series) we find that he does every test correctly up through nine years with the striking exceptions that he failed to be able to repeat five given numerals in order and that he failed to execute three simple commissions given simultaneously. He was repeatedly tested by both of us on the first point and it was found that his memory span for numerals presented auditorily was only four figures. In fact he did not get four correctly at every trial. This seemed most important in the light of the fact that one would naturally assume him, from his feats, to be somewhat of a calculating genius. In the ten-year tests he failed once. He was unable to construct a sentence using three given words. In the eleven-year tests he failed to detect nonsense in various verbal statements and he failed to be able to define some easy abstract words. In the twelve-year-old tests he was able to infer facts correctly from given circumstances verbally presented which indicated the facts. He was able to image and draw a triangle cut out of folded paper and he was able to image and draw a new form by joining transposed pieces of a diagonally divided card. He failed on all of the other tests for that age. His success in these latter tests is significant as proving his power of

visual imagery. Finally, the summary of the Binet tests is that by the old series he, by the allowances, gets partially through the eleven-year-old tests. But here, as often, the Binet system tells only a part of the story.

The words which were given by the subject in the Binet three-minute, free association test show some of his predilections. In one period he gave sixty-six words and in another seventy-three in three minutes. In each list the opening words were connected for some time with orchards and fields and outdoor life, but he soon led off to his other special interests. The majority of the remaining words in both sets deal with the name of railroads and of railroad stations, of which he gives a large number and in one list there were no fewer than sixteen words that named officials, such as supervisor, treasurer, representative, and so on. He also gave the names of eight newspapers. In connection with this it is interesting to note that he was at one time able to name all the stations between Chicago and Omaha on more than one line of railroad. He had gotten this entirely from time-tables—had never traveled over these roads. He also knew the exact number of miles between far distant stations on various roads. With regard to his knowledge of newspapers he says that he reads two Republican and two Democrat papers each week.

Naturally much of our inquiry would center about his arithmetical ability, inasmuch as it was presumed that he had some sort of a formula by which he could relate the day of the week to dates. A comparatively simple combination of numbers in oral arithmetic he failed on, but succeeded later in giving the answer to $9+3+8-7+4$. Made two errors in multiplying in a slowly done problem of long multiplication. The addition was correct and much more rapid in proportion. His memory span for numerals presented visually was proportionately as defective as the result obtained in the corresponding auditory memory span. He failed in several trials to write seven numerals after an exposure of five seconds each time. He was asked to tell what day of the week and date it was eighty-three days prior to the present day. To our utter astonishment he was totally unable to

compute this. Said that he never tried to figure things out that way. He was urged to try but finally said he could not make it.

His memory was tested in various other ways. The visual memory test of Binet in the first figure with the five seconds exposure was done correctly and very rapidly. In the second Binet figure with the same exposure, it was done rapidly, but symmetry was lacking. He traced the figure in the air as he looked at it showing use of the motor element for recall. Failed to get the symmetry of the second exposure but did finally get it after the third exposure. We asked him to draw from memory the front elevation of a building on the grounds, a fairly complicated facade, and were much struck by his ability to get all the details rapidly in a rough sketch. This, it seemed to us, would have been a hard test for a normal person and our man has had no special interest in such work. The floor plans of a couple of buildings were also rapidly and correctly sketched. With a great show of pleasure he quickly printed his name in old English text for us. He was tried on modifications of the well known "aussage" test. He was shown a picture and asked to make a report on it. His response was very excellent. He remembered most of the details very accurately and resisted every suggestion with regard to them. The same result was obtained at other trials. His strong powers of visual memory and imagery were thus amply manifested.

He was given for a memory test a verbal passage by the auditory method, the passage being repeated to him four times. "If a sailor on the ocean is shipwrecked in a wild country, he must first look for water to drink, then he must find a place to sleep where wild animals can't get at him, and after that he can take time to look for food, but he must be careful not to eat poisonous berries or fruit. Next he had better hunt for other people on the land and put up a flag to stop ships which may be going by." His response was, "If the sailor finds a place to sleep and water and food he must not find a poison, or fish, or beer, and find a flag and ocean. Ain't it? I pretty near got it all right, didn't I?" He was urged to try again, but the next time it was only a little bit more cogent. Later he was tried on the well

known phrases, "Peter Piper," etc., and "Round the rough and rugged rock," etc.—he failed on both. A still simpler passage was repeated four times to him. "In the next county on the road are heavy white stones and black boys carry them as fast as they can to the sidewalk." He failed in the recall of this also. On a passage presented to him visually for a memory test, "If a man sees that his house is on fire he should first find out if it is a large fire and if it is a small one he should put water on it. If it is large he should run to the fire-engine house and shout 'fire'. Then he should run back and help people out of the burning house and save all the money. Then he should keep the people back so that the firemen can work easily." He responded, "A man should call on the fire company and the company should come and put the fire out and save money and the people and make it easy—the people—that's what it means—the fire engine. If ever a house gets on fire they call on the fire company. Guess that's right, ain't it?"

The two so-called cross-line tests proved of special interest in this case. The second of these is very rarely done by even the high grade feeble-minded. These tests call for the mental representation of a whole figure and the analysis of its component parts.¹ The simpler of the two he did at the third reproduction after he knew it well. The second test he did correctly at the second reproduction, having mistaken the numbering in the first model. All this was to be expected from what we already knew of his abilities. He could call his visual powers to his assistance and minimize the necessity for rational analysis. With him, undoubtedly, the test was one mostly directed towards memory powers.

Coming now to some of the special intellectual feats for which this man is noted we found as follows: He recites the list of presidents, including nearly all of their first names, in thirty seconds. Tells us proudly that he knows all the governors of Iowa, the superintendents of the institution, the members of the Board of Control. Asked how he learns them he answers,

¹ For description see Psychological Monographs, Vol. XIII, No. 2, "Tests for Practical Classification."

"I read their names." Asked to write down what day he came to school, he puts down, "J. K. S. I came here at this institution on Friday, March 30, 1883 at 4 p. m. It was very Cloudy and Muddy and I came on the Frieg train."

He is always tremendously interested in the weather and tells us he used to be a weather prophet, but used to miss sometimes. We tried him on his knowledge of the weather on a few days where a record of conditions in the vicinity was available. His responses were wrong, but then the days were of our selection.

Finally, as to his most remarkable ability to tell days of the week for past years which has naturally led to the supposition that he used some secret arithmetical formula. Given three dates in 1911, he in a very few seconds gave the correct week days. From that, as a start, something of a systematic study was made of this unusual power which is possessed by no one in our acquaintance. He gave correctly two days in 1908 and then three days in 1909 in the average time of seven seconds. For 1903 he was wrong in one out of three days, getting the other two all right in eleven and thirty seconds respectively. He was asked for February 29th, 1903 and instantly said, "There wasn't any such date that year." At another time, given twenty-three dates between 1883 and 1910, he answered in the average time of ten seconds with seventeen correct answers. This makes a total of thirty-four dates later than 1883 asked, with no less than twenty-seven answers given correctly in astonishingly quick time. Previous to 1883, some seventeen dates were given with only one correct answer which, of course, might well out of that number have been a fortuitous result.

We were led to this discrimination of dates on the basis of the time when our subject was ten or twelve years of age, and thus might be expected to have memories of events, by our previous discovery of a clew as to how he accomplished his feats. In our preliminary study we doubted his ability to use even any ordinary simple arithmetical formula through the results we obtained on other tests. How then did he get his answers if not by computation? He was carefully observed for the detection of

his mental process and the following was ascertained. One of us quite accidentally looked up a day incorrectly and told him he was in error. He maintained his correctness and through cross questioning we got from him, "Well, I went on the fruit farm from the shoe shop on Monday, March 9th, and I remember that day, so Saturday was March 7th and Wednesday was the 4th. I remember that all right." He was correct. Asked about September 16 of another year and having answered correctly, he was asked, "Do you think you are right?" "I remember the 15th was on a Wednesday—that was the day Dr. M. come." Asked how he tells us December 2 of a certain year, "Oh, that's easy. The 2d was on a Saturday sure this year and Friday last year and two years ago on a Thursday. There's no leap year comes in there; every fourth year is a leap year."

It is sure then that he has ability of high order in certain powers of recall. He is well down in the feeble-minded group in his auditory memory, but he shows in various ways the strength of his corresponding visual powers. His immediate recall of this latter type, while good, was not shown to be strikingly above normal, but his long distance memory of events as such is certainly wonderful. He seems to be able to see right before him the picture of the events of the recollected day, especially as centered around the activities of a certain person, particularly himself. His very attitude and expression as he looks off in the distance while answering the questions and says to himself, "Let's see, let's see, yes, that's right, it was a stormy day," etc., may have its significance for judging of his type of memory.

The above facts all go to show that this idiot-savant in his telling of the days of the week for given dates draws upon a most remarkable memory store of events and days all tagged with their appropriate dates. From these he can work back and forth to neighboring dates in the same year or he can use his slender powers of computation to get at the days nearby in another year that is not too far off in the arithmetical series. If he had had normal arithmetical ability and had been trained, his powers would have been astonishing, although, of course, of no practical value in this particular. As it is, his reputation has hung

upon his ability to tell days within a narrow range of years. His willingness to name days for years when he was entirely unable to know them is characteristic of his general, poor judgment and his egotism. He evidently did not like to have it appear that he was flooded. It is of interest to note that the average time of his answers to the series where practically all of his responses were failures was about one-third only of the time taken for answers when he was for the most part correct.

The upshot of our study is that this supposed calculating genius is a typical, feeble-minded fellow, very deficient in matters of judgment and estimation of his relationship to the world, vain, reiterative, slovenly, poor in most of his memory powers, of the mental age by the Binet scale, of eleven years. He has just one faculty that stands up sharply above the general level of his intelligence and indeed well overtops the normal. That is the power of recall by visual imagery which is well connected up with persons and dates. Unless we are much mistaken this ability must in nature closely resemble the memory type of the late Mr. Blaine, which has been the marvel of many observers. Only the other day one of us had Mr. Blaine's ability vouched for by a careful thinker who tells us of meeting that statesman some years after he had been casually introduced in a throng to him and being at once called by name and spoken to about the events of the previous meeting, although there had been nothing of importance about the meeting and nothing to keep the memory of this chance acquaintance before him.

The genius of our subject seems to be due simply to his ability to picture clearly to himself events and also objects which he has either seen in the ordinary way, such as buildings, or which he has looked at carefully, such as time-tables. He is a great student of almanacs and the calendar and this has probably enabled him to connect up also through visual methods his dates with the memory of events. It would have been an interesting experiment to have seen to what useful extent his powers could have been utilized, say in drawing from memory, if his mental peculiarities had long ago been recognized by some such study as our. Several text books mention instances of feeble-minded

persons with special memory abilities. Students of memory types might profit well by investigation of these cases of split-off mental characteristics.

THE BINET-SIMON SCALE FOR MEASURING INTELLIGENCE. IMPRESSIONS GAINED BY ITS APPLICATION UPON FOUR HUNDRED NON-SELECTED CHILDREN

BY LEWIS M. TERMAN, *Stanford University, California.*

Through the assistance of Mr. H. G. Childs, a graduate student in the Department of Education, Stanford University, the Binet-Simon scale was tried last year upon about four-hundred children in the vicinity of Stanford University. The complete account of this work appears in a series of articles in the *Journal of Educational Psychology*, February to May, 1912.

For the authors of the study by far the most important result was a decided conviction that measuring scales of this general type are feasible, and that when corrected, extended and multiplied, they will prove of great practical value in the study of sub-normal and super-normal children.

The children tested ranged from four to thirteen years of age. The tests were uniformly given and with careful attention to thoroughness. Without entering here into details, it may be said that the results warrant a far more radical revision of the scale than any one else has hitherto recommended. The scale originally offered by Binet is, in general, far too easy at the lower end, while in the upper range it is too difficult. In fact, the range of nine years in the actual ages of our subjects was condensed into a range of only five years of test ages. Besides the frequent displacement up or down the scale, some of the tests are objectionable or unsatisfactory for other reasons. This is particularly true of the thirteen-year group. On the other hand, such tests as the description of pictures, omissions from pictures, aesthetic judgment, drawing, questions of comprehension, memory, reasoning ability, vocabulary and association, gave specially satisfactory results.

In addition to the trial given to Binet's tests, an attempt was made to extend the scale by securing age standards of perform-

ance in four other lines. The latter included, first, a generalization test (interpretation of fables); second, a graded completion test; third, a vocabulary test of 100 words; and fourth, a test of practical judgment (involving the hunting of a lost ball in a circular field.) The authors devised new methods of grading performance for the fable and completion tests which they believe will add much to the serviceableness of both. The vocabulary test is based upon Laird and Lee's Vest Pocket Dictionary, and is, therefore, designed to test the child's acquaintance with the most common concepts of everyday usage, and thus to display grade of intelligence rather than accidents of technical education. It is believed that all of the above four tests will prove usable additions to the scale. They are given in full, together with directions, in the articles referred to above.

The authors have also devised a method for calculating "test age" which they believe is a decided improvement over that used by Binet, a method which gives exactly equal value to all the tests of any year group without requiring an equal number of tests each year. The tests of a year group are given a combined value of 1, and the "unit value" of each question in a group is determined by dividing 1 by the number of tests in that group. It is thus possible to retain an unequal number of tests in the different groups without giving undue weight to any one test in the estimation of test age.

The following arrangement of the tests shows the main features of the revision which we have tentatively made, and indicates the basis upon which the present year's work is being conducted. Besides the four additional tests above mentioned we have added to the scale also a test of arithmetical reasoning, a test of "wit," and Goddard's "code" test. It is expected that the work in progress during the present year will make possible a number of other improvements.

Year III.—(Unit value, .1666). (Both must be passed.)

1. a. What's the thing to do when you feel sleepy?
b. What's the thing to do when you feel cold?
2. Weights: 3-12; 6-15; 3-12. (Two out of three.)

N. B. Examiner should check all items separately.

3. Naming objects: key—closed knife—penny. (No failure.)
4. Knows sex.
5. Repeats three digits: 6-4-1; 3-5-2; 7-8-3. (Two successes.)
6. Pictures (enumerates) 1—2—3.

Year IV.—(Unit value, .2).

1. Copies square.
2. Counts four pennies.
3. Divided rectangle.
4. Choose prettier, 1-2-3. (Must be no failure.)
5. Defines (use): a table—a chair—a horse—a mamma.
(Three out of four.)

Year V.—(Unit value, .2).

1. Morning or afternoon.
2. Names colors: red—yellow—blue—green. (No failure.)
3. Puts key on chair, brings box, shuts door.
4. Vocabulary index (score?). (See third article of this series.)
5. Repeats:
 - a. We expect to have a great time down at the seashore.
 - b. When the train passes, the engineer will blow the whistle.
 - c. Why should anyone want to harm a beautiful bird?
(One success out of three.)

Year VI.—(Unit value, .16).

1. Right hand, left ear.
2. Number of fingers.
3. Counts thirteen pennies.
4. Repeats: 4-7-3-9; 2-8-5-4; 7-2-6-1. (Two out of three.)
5. a. What's the thing to do if it's raining when you start to school?
- b. What's the thing to do if you have missed a train?
- c. What's the thing to do if you find that your house is on fire? (Two out of three.)
6. Vocabulary index, 12 per cent. (2160.)

Year VII.—(Unit value, .16).

1. Copies diamond.
2. Omissions from pictures; 1-2-3-4. (Three out of four.)
3. Names penny—nickel—dime—quarter. (No failure.)
4. Pictures (describes) 1-2-3. (Two out of three.)
5. Vocabulary index, 14 per cent. (2520.)
6. Repeats sentences, 14 to 16 syllables:
 - a. We will go out for a long walk. Please give me that straw hat.
 - b. We are having a fine time. We found a mouse in the trap.
 - c. Brother Frank had a fine time on his vacation. He went fishing every day. (One out of three.)

Year VIII.—(Unit value, .16).

1. Writes from dictation: "The pretty little girl."
2. Compares: butterfly-fly; wood-glass; paper-cloth. (Two out of three.)
3. Counts 20 to 0. (Twenty seconds.)
4. Ball and field (score 2). (See third article in this series.)
5. Repeats: 3-1-7-5-9; 4-2-3-8-5; 9-8-1-7-6. (Two out of three.)
6. Vocabulary index, 18 per cent. (2340.)

Year IX.—(Unit value, .125).

1. Value of stamps: 1-1-1-2-2-2.
2. Names date.
3. Reading for four memories. Time—
4. Weights, 3-6-9-12-15. Trial 1-2-3.
5. Fifty words in two minutes:
6.
 - a. What's the thing to do when you have been struck by a playmate who did not do it purposely?
 - b. What's the thing to do when you have broken something which does not belong to you?
 - c. What's the thing to do when you have been detained so that you are in danger of being late for school? (Two successes out of three.)
7. Vocabulary index, 23 per cent. (4140.)
8. Completion test (score—). (See third article in this series.)

Year X.—(Unit value, .125).

1. Copies designs: 1-2. (See Binet 1911 series.)
2. Three words in one sentence.
3. Six digits: 3-7-4-8-5-9; 8-2-5-7-4-6; 7-6-2-9-5-3. (Two out of three correct.)
4. Ball and field (score, 3.)
5. Vocabulary index, 26 per cent. (4680.)
6. Fables 1-2-3-4. (See second article in this series.)
7. Completion test. (score, 20.)
8. Makes change. (25c, 4c.)

Year XI.—(Unit value, .16).

1. Arithmetical reasoning (score?). (Using the following problems taken from Bonser's Reasoning Ability of Children in the Fourth, Fifth and Sixth Grades, page 2. The child is given the problems in the following form and is asked to write the answer after each problem, making no other figures.)

Get the Answers to these problems as quickly as you can:

- a. If 3-4 of a gallon of oil costs 9 cents, what will 7 gallons cost?
 - b. At 15 cents a yard, how much will 7 feet of cloth cost?
 - c. A man whose salary is \$20 a week spends \$14 a week. In how many weeks can he save \$300?
 - d. How many pencils can you buy for 50 cents at the rate of 2 for 5 cents?
 - e. A man spent 2-3 of his money and had \$8 left. How much had he at first?
2.
 - a. What ought one to do before taking part in an important affair?
 - b. What ought you to say if someone asks your opinion about a person you know only a little?
 - c. Why ought we to judge a person more by his acts than by his words?
 - d. Why do we excuse a wrong committed in anger more readily than a wrong act committed without anger? (Three out of four correct.)

3. Vocabulary index, 30 per cent. (5400.)
4. Fables: 1-2-3-4.
5. Completion test (score, 25).
6. Sees the point in following samples of wit and humor.
(E reads each passage and asks S, "What is the point of that joke?" "What is funny about that?" etc.)
 - a. A man called at the postoffice to inquire if there was a letter for him. "What is your name?" said the postmaster. "Sure," said the man, "You'll find my name on the back of the letter."
 - b. A woman was once told of a man who had twice had small-pox and had died of it. "Did he die the first time or the second?" the woman asked.
 - c. A young fellow who wanted to be witty once said to a barber, "Did you ever shave a monkey?" "Why, no sir," said the barber, "but if you will please sit down, I will try."
 - d. A religious old lady used to say that God was very good to make the greatest rivers flow past the largest cities.
 - e. A peddler in his cart overtook another peddler on the road and thus addressed him, "Hello, what do you carry?" "Drugs and medicines," the other replied. "Go ahead then?" said the first, "I carry gravestones." (Three out of five correct.)

Year XII.—(Unit value .16).

- i. Absurdities, as follows:
 - a. An unfortunate bicycle rider broke his head from a fall and died instantly. He was picked up and carried to a hospital and they do not think he will recover.
 - b. I have three brothers, Paul, Ernest, and myself.
 - c. There was a railroad accident yesterday, but it was not serious. The number of dead is only 48.
 - d. Yesterday the police found the body of a young girl cut into eighteen pieces. They believe that she killed herself.

- e. The engineer said that the more cars he had on his train the faster he could go. (Four out of five correct.)
2. Disarranged sentences: 1-2-3.
3. Reading for seven memories. (Time.)
4. Suggestion. (See Binet, 1911.)
5. Vocabulary index, 36 per cent. (6480.)
6. Repeats 26 syllables. (One out of three correct.)
 - a. My little children, you must work very hard for a living. You must go every morning to your school.
 - b. The other day I saw in the street a pretty yellow dog. Little Bessie has spots on her new apron.
 - c. Ernest is often punished for his bad conduct. I bought at the store a pretty doll for my little sister.

Year XIII.—(Unit value, .16).

1. Seven digits: 2-1-8-3-4-3-9; 9-7-2-8-4-7-5; 3-2-4-7-1-9-6. (Two out of three correct.)
2. Vocabulary index, 42 per cent. (7560).
3. Fables: 1-2-3-4.
4. Arithmetical reasoning (score).
5. Completion test, (score, 36).
6. Problems of fact, as follows. (Two out of three.)
 - a. My neighbor has been having queer visitors; first a doctor, then a lawyer, then a priest. What's happening at my neighbor's?
 - b. An Indian coming to town for the first time watched a white man riding along the street. As the white man rode by, the Indian said, "White man lazy, him walk, sitting down." What was the white man sitting on?
 - c. A man who was walking in the woods near a city stopped suddenly, very much frightened, and ran to the nearest policeman saying that he had just seen hanging from a limb of a tree, a ———.

Year XV.—(Unit value, .16).

1. Fables (score —).

2. Changes hands of clock (4 minutes to 3 o'clock). (Must be able to recognize the slight discrepancy.)
3. Pictures: (interprets) 1-2-3. (Two out of three.)
4. Vocabulary index, (score —?).
5. Completion test (score —?).
6. Uses code. (See Goddard article, The Training School, May, 1911.)

Adult—

1. Reversed triangle.
2. President and king. (See Goddard article cited above.)
3. Ball and field. (Score 4, with conditions stated.)
4. Completion test (score —?).
5. Gives sense of selection. (See Binet, 1911.)

"One hears very different judgments about the value of life. Some say it is good, others say it is bad. It would be more correct to say that it is mediocre, because on the one hand it brings us less happiness than we want, while on the other hand the misfortunes it brings are less than others wish for us. It is the mediocrity of life that makes it endurable; or, still more, that keeps it from being positively unjust."

From a considerable use of the tests with badly retarded children in school, the writer has discovered the serious shortcomings of many tests in the above list for clinical work with certain classes of sub-normals, particularly children who are handicapped by partial deafness or by insufficient knowledge of the English language. For this reason it is highly desirable that the Binet-Simon scale be supplemented by numerous other graded scales involving tests of the general nature of those set forth in the suggestive monographs by Healy and Fernald. All such tests, however, must be given an extensive trial upon normal, non-selected children of different ages before they can have any serious diagnostic value for the classification of atypical children. However, in spite of the many imperfections and inadequacies of the revised scale as it stands, I believe that by its use it is possible for the psychologist to submit, after a forty-minute

diagnostication, a more reliable and more enlightening estimate of the child's intelligence than most teachers can offer after a year of daily contact in the school room. Since all human estimations are relative to some standard, the teacher has no means of discovering whether her class, on the whole, is above or below the normal for the corresponding age. Her standard may be too high or too low, vague, mechanical, or fragmentary.

Any one who has applied the scale upon school children will appreciate the truth of this. An illustration or two may be of interest. In the local schools I examined the other day at the request of his teacher, a boy of eleven and one-half years. He was of American parentage, had spent five and one-half years in the public schools, and coming from a family of thirteen children, had evidently not lacked in educational opportunities of both the formal and informal kind. He had been promoted to the low third grade, for encouragement, not because he could do the work of that stage. The teacher (a woman of keen insight and an excellent instructor) realized that the boy was "very dull" but had never thought of classing him with children called "feeble-minded." She had worried a great deal about the boy, believing that if she could only hit upon the right kind of pedagogical treatment, and possibly also secure an operation for adenoids, the retardation might be overcome. But the tests uncovered a mentality of barely seven years, four and a half years of retardation. It is extremely unlikely that this boy's mentality will ever rise above the normal intelligence for eleven years, a clear case, therefore, of feeble-mindedness. The subject had been uniformly over-rated by his teachers because they had compared him constantly with his classmates, who averaged about three years younger. I am convinced that the number of such children in the schools is far greater than people (even teachers) have suspected, and that to segregate them in the right kind of special schools, schools of the vocational type, is an urgent duty of school administration.

Only a few of the grade of mentality just indicated ever find their way to institutions for the feeble-minded, and if they are not to become social pests they must be made

able to float in some kind of simple industrial environment. We have reason to believe that appropriate vocational training and social oversight of such children would in the end be far less costly than the present **laissez-faire** policy. Before many years it will probably become a matter of course to apply serial mental tests in the public schools to all pupils who are retarded or about to become retarded, or who give indications of unusual ability. The scientific management of special classes for atypical children in the public schools will be impossible until similar tests are multiplied indefinitely.

THE PRESENT STATUS OF THE BINET AND SIMON TESTS OF THE INTELLIGENCE OF CHILDREN

BY F. KUHLMANN, *Faribault, Minnesota*

The writer used the 1908 series of the Binet and Simon tests in examining the inmates of the Minnesota School for Feeble-Minded and Colony for Epileptics, approximately 1,300 cases. In a later article the results of these examinations will be reported so far as they throw any light on the accuracy of the tests in determining the mental development of feeble-minded children. The object at present is to bring together the scattered results of others who have used and criticised the tests, and attempt an evaluation of these in the light of the combined results and of whatever the experience of the writer is able to add.

A. The System of Tests as a Whole.

The tests are the first of their kind that have ever been offered for the purpose of determining the degrees of intelligence of children in terms of mental ages. They aim to and do accomplish much more than anything we have had heretofore. For this reason they have become at once widely popular. They have been used in many public schools throughout this country and abroad, and in a number of schools for defective children, reformatories and prisons for the practical purposes of grading intelligence. They have also been tried in an experimental way by various individuals for the purpose of testing their accuracy and to discover revisions where found to be needed. As a result of these combined circumstances and unusual activity we have already a considerable mass of data and criticisms that point the way to a rapid progress. There is, however, a sharp line to be drawn between two kinds of results from the use and study of the tests. These are (1) the actual degree of correlation found between the different tests of the system and the preformance in

¹ With a few exceptions in the procedure in giving a test, they were used exactly as given in my account of them in this Journal, Vol. XV, 1911. The reader is referred to this account for any information in regard to them that is assumed in this article.

them of normal children of the different chronological ages, and (2) generalizations and deductions as to the value of the tests, based largely on an *a priori* analysis of the nature of the tests and on what we know or assume about the mental development of normal children. The latter can have but little value where they contradict the former, provided that the methods of determining the correlations are themselves free from criticism. The results and criticisms of the tests will therefore be considered under the following headings: (1) Statistics with normal children, and (2) general observations and criticisms.

1. Statistics with Normal Children. The point in question here is how closely the mental ages as determined by the tests agree with the chronological ages of normal children tested. The final proof of the degree of accuracy of the tests must be given by the degree of this correlation. For the 1908 series Binet and Simon tested 203 children of the schools who were up to grade, that is, were in the grades in which they should be according to their chronological ages. For 192 of these they give the results in the following table.²

TABLE I.

Chronological Age	3	4	5	6	7	8	9	10	11	12	Total
Regular	3	9	13	5	7	16	11	14	13	2	93
Advanced 1 Year	3	2	6	8	7	5	9	2	..	..	42
Advanced 2 Years .....	..	1	..	..	..	1	..	..	..	..	2
Retarded 1 Year	4	4	4	6	3	1	2	9	5	5	43
Retarded 2 Years .....	..	1	..	1	1	..	..	3	2	4	12
	—	—	—	—	—	—	—	—	—	—	—
Total	10	17	23	20	18	23	22	28	20	11	192

These figures give the number of children tested for the chronological ages of three to twelve years. The term "regular" means children whose mental ages and chronological ages agreed. Likewise the terms "advanced" and "retarded" mean children whose mental ages were greater than or less than the chronological ages, respectively.³ As is seen the correlation is perfect in

² Le Developement de L'Intelligence chez les Enfants. L'Annee Psychologique, 1908, P. 73.

³ In the totals the authors give 103, and 44 for 93 and 43, respectively, in the present table, apparently errors in adding.

93, nearly half, the cases, and there is a discrepancy of over a year in only 14 cases.

In giving the tests to other than French children a number of changes and adaptations of the original must be made, resulting from translation of verbal material used in the tests, and from incidental differences in the civilizations of different peoples. Further, the average normal intelligence of children of different nationalities might vary. Hence Goddard first determined the norms for these tests with 2,000 American school children, for 1,547 of which he gives tabular results. The following is one of his tables:

TABLE II.

Age	2	3	4	5	6	7	8	9	10	11	12	13	Total.
4 .....	...	1	2	2	3	...	...	...	...	...	...	...	8
5	2	4	8	40	40	16	4	...	...	...	...	...	144
6	1	...	3	29	48	69	9	...	1	...	...	...	160
7 .....	...	1	2	8	15	114	50	4	3	...	...	...	197
8 .....	...	...	2	2	1	87	86	16	12	3	...	...	209
9 .....	...	...	...	...	...	27	54	56	58	4	2	...	201
10 .....	...	...	...	...	...	15	24	19	124	27	8	2	222
11 .....	...	...	...	...	...	4	13	25	50	60	12	1	166
12 .....	...	...	...	...	...	4	10	13	42	36	39	7	144
13 .....	...	...	...	...	...	1	5	6	30	19	21	3	89
14 .....	...	...	...	...	...	...	1	1	6	5	4	...	20
15 .....	...	...	...	...	...	...	...	3	...	1	2	...	6
Total	3	6	17	81	111	337	256	143	326	155	88	13	1547

The first horizontal column gives the mental ages, and the vertical column on the left gives the chronological ages. The others give the number of children tested under each age. From these figures Goddard concludes that "To a person familiar with statistical methods the foregoing curve itself amounts to practically a mathematical demonstration of the accuracy of the tests..... We are forced to the conclusion that the questions that Professors Binet and Simon have selected are well graded, at least from the ages five to twelve, and that they fit the ages to which they are assigned."

In addition to this Terman and Childs give statistical results

4 Two Thousand Normal Children Measured by the Binet Measuring Scale of Intelligence. Ped. Sem., 1911.

of the examination of 396 California public school children.⁵ They give the gross results in the following form:

TABLE III.

No. Tested	29	83	26	29	43	49	33	44	35	17	6	2
Av. Chron. Age	4.75	5.5	6.37	7.5	8.5	9.5	10.5	11.46	12.33	13.42	14.58	15.2
Av. Men. Age	6.0	6.5	6.5	7.5	8.0	9.0	10.0	10.0	10.5	11	12	11.5

The first horizontal column gives the total number of children tested for the different chronological ages. In the second column the first figure, 4.75, gives the average chronological age of the 29 children, whose ages were between four and five. Likewise, the second figure, 5.5, is the average age of the 83 children, whose ages were between five and six, etc. The third column gives the average mental ages minus a half year in each case, which is subtracted from the authors' figures to make them more directly comparable with the others. Terman and Childs add a half year to the mental age of a child as determined by the tests, on the basis of the assumption that the chronological ages as given by Binet and Simon are all a half year smaller than they should be, since they seem not to have considered fractions of a year, but called all children between five and six, for example, five years old. They have also not followed Binet and Simon's rule of adding a year to the mental age for every five tests a child passed beyond the age group in which he passed all or all but one. In place of this they added a half year for every three additional tests thus passed for the age groups III to VI, inclusive. For the seventh year a half year credit was given for four tests. From the ninth to the twelfth year, inclusive, three tests passed counted again for a half year, and five tests passed for a whole year in the mental age. For these variations in the procedure corrections in their figures cannot be made from the data given. This complicates matters very much when we aim at a really accurate comparison of results. It is impossible to say with certainty in what direction Terman and Childs' procedure tended to vary their results from those of others. They conclude from

⁵ A Tentative Revision and Extension of the Binet-Simon Measuring Scale of Intelligence. Jour. of Educat. Psychol., 1912.

their results that "the scale is far too easy at the lower end, while at the upper end it is too difficult."

Statistical results with the tests for normal children have been obtained also by Miss Johnston, who examined 200 school children of Sheffield, England; by Bobertag, who adapted the tests for German school children and examined 435; and by Isabel Lawrence, who tested 784 Minnesota school children, using only the tests that have to do with giving definitions of terms. In none of these, however, are figures given to show the degree of accuracy of the system of tests as a whole. Some of their figures will be considered when we come to discuss the individual tests. On the question of the degree of the accuracy of the tests as a whole as indicated by the degree of correlation given in statistics with normal children we are limited, therefore, to the results from the three sources given. Are the methods by which these figures have been obtained free from criticism, and what conclusions from them are justified? We may take up at this point such general observations as are concerned directly with these statistics themselves.

The authors themselves give results for only 192 children examined, and it has been objected that such a small number is inadequate.⁶ This inadequacy becomes obvious when we note that the total number of children examined for the different chronological ages ranges from ten to twenty-eight. The same criticism does not apply to Goddard's figures, excepting for the chronological age of four. Wallin apparently objects to these results on the grounds that Goddard's cases were not selected children, but undoubtedly included some mental defectives. The

⁶ Journ. Educat. Psychol., 1912, P. 70.

⁷ An English Version of M. Binet's Tests for the Measurement of Intelligence. Training School Record, London, 1910.

⁸ Ueber Intelligenzpruefungen (nach der Methode von Binet und Simon). Zeitschr. f. angew. Psychol., 1911.

⁹ A Study of the Binet Definition Tests. Psychol. Clinic, 1911.

¹⁰ Wallin, J. E. W.: The New Clinical Psychology and the Psycho-Clinicist. Journ. Educat. Psychol., 1911. P. 204. Terman, L. M.: The Binet-Simon Scale for Measuring Intelligence. Psychol. Clinic, 1911, P. 200.

same holds true of the results of Terman and Childs. He suggests selecting children who are up to grade in their school work as a method adequate for practical purposes. The present writer is inclined to add that some of the testing appears to have been done rather hurriedly. This is inferred from the statement that an examiner tested from twelve to thirty children a day, apparently during only the school hours. Concerning the time required to test a child carefully, I am on the whole in accord with Wallin's statement that "To examine five or six pupils in an hour at a given level in the scale means partial and perfunctory work, and will render the try-out essentially unscientific,"¹¹ with which statement Terman and Childs seem also to agree in noting that "tests carried through at the rate of 20 to 30 per day are sure to give unreliable and misleading results."¹² Another criticism would be that he seems not to have taken account of the exact chronological ages as much as should be demanded. If a child, for example, is called six years old until his next birthday it is obvious that the average age for large numbers called six years old will be about six and a half years. If in this procedure a scale of tests were adjusted so that the results would come out correctly according to the chronological ages given the tests would all be too difficult inasmuch as they would all fit higher chronological ages than indicated. But since the mental progress made from one year to another by a young child is much greater than for an older child, the errors in the scale of tests would be much greater for its lower than for its upper part, and would decrease proportionately to the rate of mental development. Moreover, when the actual chronological ages of a number of children who are called six years old range from six to seven it is evident that the mental ages determined by a scale of tests that is entirely correct must also range from six to seven for really average normal children. With an imperfect scale of tests and with a group of children varying from the average normal the degree of correlation between the results of the tests and the chronological ages given must therefore be considerably less than it

¹¹ Human Efficiency, Ped. Sem., 1911, P. 81.

¹² Journ. Educat. Psychol., 1912. Foot-note, P. 65.

should be. This criticism is even more applicable to Binet and Simon's results, if they also have not taken account of fractions of a year in considering the chronological ages, since their number of cases is so much smaller. But one would hardly suppose that under this circumstance they would disregard this matter. This brings us to a comment on a part of the conclusion Goddard draws from his figures, namely, that the tests fit the ages to which they are assigned. The figures themselves show exceptions to this statement for several different ages. It will be noted in his table that five-year-old children are six years old mentally as often as they are five. Six-year-old children are seven years mentally oftener than they are six. The eight-year-old children are only seven mentally as often as they are eight, and those nine years old are mentally eight, nine, and ten with about equal frequency. For eleven-year-old children the mental age is ten nearly as often as it is eleven, and for the twelve-year-old the mental ages are ten, eleven and twelve with no conclusive difference. In other words, for six out of the nine chronological ages (excluding the chronological age of four because the number of cases here is inadequate) Goddard's conclusion does not quite hold. If we accepted Goddard's method of obtaining his norms as quite free from any criticism it would be true that for the chronological ages of five, six, eight, nine, eleven and twelve the tests give an error of a year in the mental ages as often as they give the correct mental age. Comparing the results of Goddard with those of Terman and Childs, it is seen that, even with considerable difference in procedure, they agree in showing the tests in age groups V and VI as too easy, and those of age groups XI and XII as too difficult. If we regard the above criticisms as essentially valid, it leaves the question we stated at the outset as to how closely the mental ages as determined by the tests agree with the chronological ages of normal children still largely an open one. However, there seems to be sufficient indication to warrant the claim that the tests on the whole give much more accurate results than we can obtain at present in any other way, except by close observation of the individual child for periods of many months or years. For all but the lowest part of the scale

an error of only a year in the mental age is very accurate compared with the judgment the teacher is usually able to give of her pupils. Normal children probably vary over about the range of a year from their average performance in a given chronological age.

2. General Observations and Criticisms. From the use and study of the tests there has resulted a miscellaneous group of observations and criticisms that are not a matter of statistics or based on statistical results. So far as these are not concerned with any one or few individual tests they will be considered next.

a. Lack of standardization. It has been pointed out that the authors have not given sufficient directions as to just how each test is to be given and how the results are to be interpreted in each case.¹³ This is true in a large number of instances and in a variety of ways that cannot all be enumerated here. In my account of these tests¹⁴ more specific directions have been added in some cases, but they are still far from complete. In response to this lack Wallin has also published an account of the tests in which an attempt is made to remedy this deficiency.¹⁵ The authors in their 1911 revision of the tests have improved the 1908 series considerably in this respect.¹⁶ The matter is of much importance, inasmuch as quite different results may often be obtained by only a slight variation in the procedure. It follows that in this refinement of the method the testing-out is yet to be done before the best ways are found with reference to these details.

A special and important instance of lack of standardization has appeared in the necessary adaptations from the French for other than French children. These adaptations have not always been equivalents of the original, and have in some instances included unnecessary changes. Substitution of sentences to be

¹³ Wallin, J. E. W., *Ped. Sem.*, 1911, P. 78.

¹⁴ See this *Journal*, 1911.

¹⁵ A Practical Guide for the Administration of the Binet-Simon Scale for Measuring Intelligence. *Psychol. Clinic*, 1911.

¹⁶ La mesure du developpement de l'intelligence chez les jeunes enfants. *Bull. de la Societe Libre pour L'Etude Psychologique de L'Enfant*, 1911.

repeated for translations of the French, of words to be defined, of American coins for French in tests in which these are involved, of pictures used in some tests, and changes in the arrangement of words to be put in order to make a sentence, are illustrations.

b. Inequality of number of tests for different ages. In the 1908 series the number of tests for each age varies from three to eight. The rule given for determining the mental age from the results is to credit the child with the mental age of the highest age group of tests in which he passes all, or all but one, plus one year for every five tests he passes beyond this point. This complicates the scoring, especially when it is attempted to give the mental age in terms of fractions of a year. Thus, as Wallin notes, "If the subject passes age six by virtue of two failures in age seven he can obtain one and one-fifth year of credit for age seven; i. e., one-fifth of a year more credit than if he were credited outright as having passed age seven."¹⁷ It is obvious also that for those age groups in which there are only three or four tests an extra year of credit may be obtained by passing only two or three extra tests beyond the age group in which all but one are passed. This difficulty, however, is not in itself a serious matter, as it can be easily remedied. Terman and Childs suggest the plan of attributing a "unit value" to each individual test that is given by the fraction of one over the number of tests in the age group in which the test in question is found.¹⁸ This assumes that a test has the greater value for determining the mental age the less the number of tests that are found in its age group, an assumption which the authors might be supposed to have made, since they left the number of tests unequal. There is no evidence that the assumption is correct, yet the plan is a considerable improvement over Binet and Simon's old procedure. In their 1911 revision of the tests the authors have reduced the number of tests to five for each age group, excepting for the four year group.

c. Communicability and coaching. It has been objected that whenever a group of children that associate with each other are examined the brighter ones who have already taken the

¹⁷ Ped. Sem., 1911, P. 80.

¹⁸ Psychol. Clinic, 1911, P. 201.

tests may communicate them to others and coach them, which makes them tests on the ability to profit by such coaching rather than of native intelligence.¹⁹ To this Goddard has replied that a child cannot learn to do a thing if the task is beyond the natural abilities of his mental age, cannot retain what has been told him, and has found such coaching "practically without any influence upon any of his results."²⁰ The present writer has met some instances which tend to confirm Goddard's conclusion, but is not convinced that the rule has not too many exceptions to make the matter of possible coaching of some children by others already familiar with the tests a serious consideration for the upper part of the scale. **A priori** it seems quite plausible to suppose that a child might, for example, retain three words given him to use in a sentence he is to construct (Test X 3) and tell another so that the latter, with plenty of time, could think of such a sentence and thus be prepared for the test, even though both were considerably below the mental age of the group in which the test is found. The same might be said of the tests on definitions of abstract terms (Tests XI 4, XIII 3), of the test on "Words to put in order" to make a sentence (Test XI 5), of "Rhyming words" (Test XII 2), of "Drawing a cut in a twice folded piece of paper" (Test XIII 1), and possibly of "Drawing the figure of two juxtaposed triangles" (Test XIII 2). The question is an important one, since any test that can be communicated and be prepared for in any way can have only a temporary value, even outside of their application to children associated in groups, as in the schools and institutions. For in the long run such tests, used for such a purpose as testing a person's intelligence, are sure to become a matter of more or less common knowledge. We shall return to this question in an other connection.

d. The effect of training. The term "training" will be used here in the wide sense to include everything the child may acquire through the influence of his total environment. We will thus be concerned with a number of criticisms that have been worded differently, but which all amount essentially to the same

¹⁹ Wallin, J. E. W., in *Ped. Sem.*, 1911, P. 79.

²⁰ *Ped. Sem.*, 1911, P. 233.

thing. This is that many of the tests are tests merely of what the child has acquired, has learned, and do not necessarily test his intelligence at all. This is true because what a given child has learned depends upon the opportunity for learning that his total environment has offered as well as upon his native intelligence. But since these opportunities vary so much in particular things from one child to another, his acquisitions may be no indication of his intelligence in any given case. Practically every writer commenting on the tests has made this criticism. The details of this discussion cannot be given here. In noting the different tests, however, that the critics have pointed out as affected by training it is seen that there is not very much agreement as to which tests are poor for this reason. Moreover, the authors admit that a number of the tests are thus affected, discuss the question at issue, and point out how such tests may still be used as tests of intelligence. Let us, therefore, turn first to the authors themselves.

The authors do not give any clear account of their position on this question, and apparently do not point out all the tests that they would probably regard as seriously affected by training, and with what reservations each is to be used. Moreover, they do not definitely state all the assumptions that are implied in the various comments scattered throughout their several publications on the tests. This has confused the issue and has led to some uncalled-for criticisms. In the first place, they admit that the tests do not all measure intelligence directly. They measure a complex, with the results depending on (1) intelligence, pure and simple; (2) acquisitions due to special training and teaching; (3) school acquisitions that appear at a certain age only; (4) acquisitions relative to language and vocabulary, due possibly to both school and home training.²¹ Taking into account also comments made in connection with individual tests, we find the following: (1) When, in case of certain tests, the child passes no conclusion is to be drawn as to his native intelligence. For unusually favorable opportunities for learning the particular things in these tests may be the cause of the child's ability to pass. If,

²¹ *L'Annee Psychologique*, 1908, P. 80.

however, he fails in them it shows his lack of intelligence. In this class they give counting four pennies (Test V 4), copying a written phrase (Test VII 3), reading for two memories (Test VIII 1), in case of adults of thirty years or over, naming four common pieces of money (Test VII 8), naming four colors (Test VIII 3), naming the days of the week (Test IX 2), and naming the months of the year (Test X 1. (2) When in certain tests the child fails to pass no conclusion is to be drawn, because unusually unfavorable opportunities to learn may be the cause of failure rather than lack of intelligence. But if he passes it shows a certain degree of intelligence, because this is involved in the acquisition in question. In this class are given reading for two memories (Test VIII 2), in case of children from eight to ten years, giving the date (Test IX 1), and naming the months of the year (Test X 1). These statements clearly involve certain admissions and assumptions, though they are not all definitely expressed. They admit (a) that environmental opportunities may be unusually favorable as regards acquiring the ability to pass certain tests, so that the results of these tests may not give any indication of the degree of intelligence; (b) that environmental opportunities may be unusually unfavorable, so that likewise the results of certain other tests do not give any indication of the degree of intelligence. They assume (c) that environmental opportunities are always at least adequate for the normal child to acquire the ability to do the things in some of the tests at the age indicated by the age group in which the tests are found. This is implied in the statement under "1" that if the child fails it shows lack of intelligence. They assume (d) that certain acquisitions must await the development of a necessary degree of intelligence that is involved in the acquisition, which development of intelligence cannot be accelerated materially by unusually favorable conditions. This is implied in the statement under "2." How does this affect the system of tests as a whole?

It will be seen that the authors name approximately a sixth of the tests as affected by training, and that whether or not these give any indication of the degree of intelligence depends on whether the child passes or fails in them in the different in-

stances. But it is difficult to see why others not named should not also be added to the list if some of those given belong there. If counting four pennies (Test V 4) belongs to class "1" why should not also counting thirteen pennies (Test VII 7)? If naming four common pieces of money belongs here (Test VII 8), why should not also naming nine pieces of money (Test X2)? Also, we must add Test IX 5, since it is identical with Test VIII 1. Likewise for class "2", if a child fails to read (Test VIII 1) because of lack of opportunity to learn, why should he not also fail to write (Test VII 3, and VIII 5) for the same reason? If he fails in these for this reason, why should he not fail to know his own age (Test VI 5), to count, to name four or nine pieces of money, to count the value of stamps (Test VIII 2), and others that might be mentioned, for the same reason? It is noted that Test X 1 is given under both classes. In a word, there is no *a priori* reason why all the tests named for both classes and others besides might not as well belong to either one of the two classes alone. In the present writer's judgment the authors have done the same thing here as have their critics. They have picked out certain tests as affected by training because it seems plausible on the surface that they might be thus affected, instead of stopping with what empirical facts can show in regard to this question. But one of the results of the use of the tests and of the criticisms has been to show that this question cannot be decided in this way. It is one of the most important questions any test of intelligence has to deal with, and at the same time one of the most difficult to solve. The degree of validity attached to either of the implied assumptions of the authors as stated above is not yet determined. Yet in order that a test may be unaffected by training both assumptions must hold true for it. Meumann ²² makes an observation that applies here, to the effect that beyond the age of four there is no knowledge that may not be acquired through school or parental training and which may not vary with different children. We might

²² Der gegenwaertige Standt der Methodik der Intelligenzpruefungen mit besonderer Ruecksicht auf die Kinderpsychologie. Zeitschr. f. exper. Paedagogik, 1910.

note in general that differences in acquired knowledge and abilities of different children as due to differences in environmental opportunities undoubtedly increase rapidly with age, so that the problem of avoiding the effect of this in tests of intelligence varies accordingly. The contention has been repeatedly made that to test intelligence we must test mental functions directly (sensory discrimination, perception, memory, attention, etc.) as distinct from determining merely mental content. The development of these mental functions is supposed to be influenced but little by any differences in environmental opportunities. To the writer the supposition in itself seems a very plausible one. But in attempting to measure intelligence by testing these functions the following difficulties have been found. We cannot yet adequately isolate these functions in any tests so far devised, and in a given test we therefore do not always know what function we are testing most. Consequently we do not yet know what degree of correlation exists between any one or several of these functions and intelligence. Further, these functions cannot express themselves except through mental content any more than they can develop except through use. To test attention we must test attention to some particular thing, the same being true of every other function. Now the degree of perfection of a function as thus determined has been found to vary somewhat with the particular thing chosen. One thing is attended to better than another, one thing is remembered better than another, and a given function also seems to improve in a small measure at least with continued practice with a given mental content. In other words, even though we could completely isolate the mental functions for the purpose of determining their degree of development, and if there were a close correlation between them and intelligence, we would still not be entirely free from the question of the effect of training, but would only have materially reduced the degree of this effect. From these various considerations the writer is forced to the general conclusion that under the circumstances we can at present do no better than to keep these facts and criticisms in mind and rely on the actual empirical results of

a test, the results showing how closely it actually does correlate with known degrees of intelligence, in judging its value and in deciding on the need and nature of a change or substitution.²³

e. Some of the tests are too mechanical. Decroly and Degand, chiefly, have advanced the criticism that a number of the tests are too mechanical. This means that the tasks involved in them can be performed in a semi or entirely automatic manner without intelligence taking any part. Counting pennies, naming the days of the week, and the months of the year are illustrations. In its further analysis their criticism really reduces itself to the just preceding, the effect of training. For the performance of any of these tasks was not automatic from the beginning with the child. They are not inherited reflexes, but had to be acquired through the combined influence of intelligence and training. If then any of the tests are too mechanical it can mean simply, so far as this criticism alone is concerned, that they are placed too high in the scale. They should be placed at the point where the child has not yet learned to do the tasks involved automatically. We thus see that the last three criticisms considered are concerned with essentially the same question.

f. Some of the tests are wrongly placed in the scale. The several revisions of the system of tests that have been offered so far have been concerned mostly with shifting various individual tests up or down the scale because they were regarded as too easy or too difficult for the age groups in which they were originally placed. Since the correct rating of each individual test is the fundamental thing in the whole system, this question is of the first importance. If the tests thus affected are otherwise good, however, the defect is much more easily remedied than is the defect that comes from varying degrees of the effect of training with different children. The second part of this article will be concerned with the question of what individual tests are subject to this criticism. We will note only a few general conclusions at

²³ For the main criticisms and discussion on this question of the effect of training on the tests see especially the following. Binet and Simon, in *L'Année Psychologique*, 1908; Decroly and Degand in *Archives de Psychol.*, 1910; Bobertag in *Zeitschr. f. angew. Psychol.* Vol. V.

this point. Wallin²⁴ thinks that the "aggregate difficulty of the tests for a given age may be greater than that for a higher," and that the upper part of the scale is especially defective. Miss Johnston²⁵ finds the tests for the age groups of six and seven too easy, and those of the age groups from ten on too difficult. Terman and Childs' conclusion was already given above, namely, that "the scale is far too easy at the lower end, while at the upper end it is too difficult." The same conclusion seems also indicated by the results of twenty-four children tested by Alice Descoeudres.²⁶ On the other hand, this does not agree with Goddard's revision of the scale, and agrees only in part with the revision of Binet and Simon, though Goddard's own figures tend again to verify it.

g. Defects of omission. It has been objected that the tests are of the intelligence chiefly, but the intelligence is only one of a number of functions of the mind. We should have tests of all the other mental functions as well.²⁷ It is his total mental development that we are interested in, not its development along one particular line alone. To carry this suggestion out in detail would mean that we should have tests that would give us not merely the mental age in general, but the age development of sensory discrimination, of motor co-ordinations, of memory, of perception, of attention, of the feelings and emotions, etc. Any adequate discussion of this question would involve a precise definition of the term "intelligence," which the writer is not prepared to give. But there are several things that may be noted without attempting such a definition. The authors use the term "intelligence" loosely, and their tests are not merely or chiefly, even, of intelligence in the narrower sense of the term as used in current psychology. It would be difficult to say just what they do test in each individual case, if an analysis of the mental processes in-

²⁴ Ped Sem., 1911, P. 78.

²⁵ Journ. Exp. Ped. and Training College Record, 1911.

²⁶ Archives de Psychol., 1911.

²⁷ See Huey, in Journ. Psycho-Asthenics, 1910; Wallin, in Ped. Sem., 1911, and in Journ. Educat. Psychol., 1911; and Pyle, in Journ. Educat. Psychol., 1912.

volved in the child's mind is asked for. They are tests that have been found in an empirical way to give results which show the general mental development of a child. The question as to what mental processes are involved in the tasks the child has to perform is ignored in most cases. Clearly the tests do not aim at a systematic determination of the development of any particular mental function. Further, some of the mental functions are hardly involved in any of the tests, the general motor co-ordinations, and the feelings and emotions, for example. It is to this latter fact that Huey and Wallin object chiefly. It is in the general form given above that Pyle states the criticism. The latter seems to imply that we would arrive at a better solution of the practical problem of finding tests that will accurately determine the general mental development by setting out to devise tests that will systematically test the different mental functions. For the reasons already given above concerning the testing of mental functions, the writer doubts very much that this could be done at present. It would, of course, be highly desirable to do so as a means of determining special mental traits aside from the task of determining general mental development. But that is another matter, and it is not a defect of the tests that they do not accomplish what they do not aim to do.

A criticism of more importance is Huey's contention that mental development goes on to adult age and beyond, while the tests stop at the chronological age of thirteen. It is just at this point, in fact, that many of the sexual and social instincts, for example, begin a period of rapid development. Many of the conflicts between the individual and the laws and customs of society occur because of the combined influence of a previous slight defect in development and what appears in the total mental development after thirteen. Thus it happens that the tests fail to cover just that part of the field where accurate determinations are at present needed perhaps most of all, at and around the border-line between the normal and the defective for the higher chronological ages.

B. The Individual Tests.

1. Statistics on Individual Tests. It is not implied or as-

sumed in these tests that each individual one will always give correct results with normal children, but only that it will do so in a certain fixed percentage of cases. It is assumed, let us say, that seventy-five per cent., at least, of normal children of the age indicated by the age group in which a test is placed will pass that test. The authors do not give any such exact percentage on the basis of which each individual test is rated. Goddard chooses seventy-five per cent. and Terman and Childs, sixty-six per cent. as a basis. Under this condition an error in determining the mental age may accidentally occur, but the chances for such an error are decreased, of course, with the increase in the number of tests in the age group. The figures given above showed with what frequency such an error occurred, assuming that the methods of obtaining these figures are themselves faultless. We are now to consider similar results for the different individual tests, to determine the accuracy of the assumption that each test will give correct results in the given fixed percentage of cases. Complete statistics to cover this point are not yet at hand, since no one has tested a sufficient number of normal children for the lower and upper limits of the scale. Further, there are a number of other considerations which must be taken into account, which make the comparison of results of different authors difficult. The chief ones of these are (a) that the exact chronological ages of the children tested have not been given, fractions of a year not being considered, with the exception of Bobertag's results given in the next table. (b) The number of children for any individual test is often very small. From these two facts combined, there is no way of knowing what the exact average ages of the children were whose ages are given as five, six, seven, for example. With large numbers for each of these ages we might reasonably assume that the chance distribution would make the average ages five and a half, six and a half, and seven and a half, but this can obviously not be assumed for such small numbers. In any given case children called six years old may have been practically seven years old. Consequently we would expect from this alone that a frequent variation of a year in the mental ages as determined by the tests in the hands of different authors

with different groups of children would occur. A discrepancy of a year, therefore, can be of no great significance as regards the accuracy of a test. (c) Different authors have not used the same adaptations required for some of the tests for other than French children, and there is also considerable occasion for other variations in the procedure of giving a test and in the interpretation of the child's responses for a number of tests in which this procedure has not yet been sufficiently standardized. We do not yet know definitely what differences these variations in the procedure may produce in the results. The following table shows the lack of agreement of the different authors as to the accuracy of the individual tests.

TABLE IV

	V	VI	VII
	1 2 3 4	1 2 3 4 5 6 7	1 2 3 4 5 6 7 8
Goddard	c c c c	c D c c c c c	c c c c c c c c
Terman & Childs	e e e e	c d E E E e e	d c c c d D e d
Bobertag	c	d d D	c c d c e
Johnston			d e d c c
Binet & Simon	c c c c	d c c d c	d e e c e

	VIII	IX	X	XI	XII
	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4	1 2 3 4 5	1 2 3 4
Goddard	d c e c d e	c e d d c c	e c c c	c d c d c	c e d
Terman & Childs	d D E d e d	c E D D D D	e c c D	D e c D D	D E D
Bobertag	c c c	d e c d	c d	d D d d	d
Johnston	E E d E	d d d d	e d D D	D d D D	
Binet & Simon	e e c c	e c c d	e e c c	e d d d	D D D

The first horizontal columns give the test numbers, the Roman numerals giving the age groups. The Arabic numbering of the individual tests corresponds to the numbering of the tests in my account of them in this Journal, 1911. A "c" means that a test thus marked is correctly placed in the system according to the percentage of children that passed it, as tested by the author in-

licated on the left. A small "d" means that the test is too difficult, and should be moved up one year in the scale. A small "e" means that the test is too easy, and should be moved down one year. A capital "D" or "E" means that the corresponding test should be moved two or three years up or down, respectively. For the blank spaces no figures are given by the authors on the corresponding tests. For the first three these ratings of the tests are based strictly on the figures given by the authors, and do not in all instances agree with the rating the authors give themselves, as they seem to have taken into account other data besides their own statistics on a test. The ratings given for Binet and Simon are taken from their 1911 revision of the scale. This revision is based only in part on the statistics they give.²⁶ A test is regarded as belonging in the lowest age group in which seventy-five per cent. or more of the children of the corresponding chronological age pass. If, for example, sixty per cent. of five-year-old children pass Test VI 1, and seventy-five per cent. or more of six-year-old children pass it the test is regarded as correctly placed in age group VI. With this procedure it happens with a number of tests that wrong results are obtained with the majority of children of a given age, since if between fifty and seventy-five per cent. of the children of a given chronological age pass a test that test is placed in an age group higher than this chronological age. A glance at this table now will show the following. (a) There are but few tests on which all authors agree, nearly all suffering a shift of a year up or down the scale. (b) The greatest disagreement is for tests in the upper part of the scale. (c) The results of Terman and Childs indicate much more frequent and greater errors than do those of any of the others. (d) The results of all taken together show that 21 of the 44 tests considered should not be shifted by more than one year. Twenty-three should be shifted by two or three years according to one author or another. (e) Excluding the results of Terman and Childs, only 6 out of 35 should be shifted by more than a year, up to the group of XI.

²⁶ Miss Johnston's original article was not available to the writer. The ratings given here are taken from a table in the *Journal of Educational Psychology*, 1912, P. 104-5.

These are VI 2, 7, VIII 2, 3, 6, X 4. (f) For 15 of the tests the ratings in each ranges from too easy to too difficult. These are VI 3, 5, 6, 7, VII 1, 4, 5, VIII 2, 6, IX 1, 2, X 2, XI 1, 2, XII 2. (g) There is substantial agreement on the following: VI 2, VIII 1, IX 6, XI 4, 5, XII 3 are too difficult. VIII 3, IX 2, X 1 are too easy. What general conclusions can we draw from these results? From what has been noted already, we may say in the first place that the very frequent shift of one year only as indicated by these results may be a consequence of the general procedure in not taking account of fractions of a year in the chronological ages and the small number of children for each chronological age, instead of showing that the tests are too easy or too difficult. The results are what we would expect from the procedure. We do not know what Binet and Simon themselves did in regard to this question. If their test ages are all a half year less than they should be, from not having taken account of fractions of a year in the ages of the children tested, and the tests were all correctly placed, the results of these other authors would sometimes show a test too easy by a year and sometimes too difficult by a year. In the rough this is the case, there being 65 d's and 38 e's in the above table. If, on the other hand, the chronological ages of the children tested by Binet and Simon were all just as given, namely, five, six, seven, etc., years instead of five and a half, six and a half, seven and a half, etc., the results of the other authors would frequently show the tests as too easy rather than as too difficult, which, as is seen, is not the case. In this connection it is worth noting further that Bobertag's results show twelve tests too difficult and only two too easy. Bobertag's children were all of a chronological age within two months of the test ages, being an exception to the procedure of the others, and making his children presumably about a half year younger for each age given than were those of the other authors. The second general conclusion indicated by this table is that the smaller differences in the procedure in giving a test and in interpreting the children's responses as followed by different examiners may make a large difference in the results obtained, and that better standardization of the tests in this respect is one of their chief needs. We

are forced to this conclusion except for two other possibilities: (a) The average intelligence of the children tested by one author may have differed from that of the children tested by another author. This is not likely from general considerations, and is also not indicated by the details of the results. It is not likely, for instance, that the younger children tested by Terman and Childs were more intelligent than the younger children tested by others, while the older children tested by them were not. (b) The tests may be much affected by home and school training, and the acquisitions from these sources may have varied from the children of one author to those of another. But again this does not seem likely. On this supposition the results for the two different groups of American children should be more alike than for two groups of children of different nationalities. But the opposite is the case. This lack of agreement of the different authors is very probably due to the examiners, not to the children tested or to the tests. The third conclusion is that several of the tests are seriously misplaced in the system, the results of all substantially agreeing that these are too easy or too difficult.

2. General Observations on Individual Tests. The several authors quoted above have not always followed their own figures in concluding that a test is too easy or too difficult, but apparently have taken other observations into account. These other observations are usually not given, but we may note the instances in which the statistics have not been the sole criterion for passing on the accuracy or inaccuracy of a test. Goddard's figures show that tests VIII 3, (6), IX 2, XI, XII 2, (4) are too easy; that VI 2, VIII 1, 5, IX 3, (4), XI (2, 4), XII 3 are too difficult. Those enclosed in parenthesis he does not name as wrongly placed, and he adds X 2 as too easy.²⁹ In his revision of the scale³⁰ he does not follow either his figures or his recommendations in a few instances. Here he transfers VII 5 to VIII, retains IX 3 in IX, drops X 4b (second series of questions in X 4) for a new test, and retains XII 3 in XII. Bobertag dismisses a number of the tests as poor for various reasons without giving

²⁹ Ped. Sem., 1911.

³⁰ Training School, 1911.

his figures that show how the tests actually worked in practice. Some others he speaks of as good or poor apparently without reference to his figures, and concedes at the outset that he does not regard his statistical results as having any great value, because further careful testing might give essentially different results. He had about forty children for each age tested. Thus VII 2 is mentioned as too easy in contradiction to his figures. IX 2 is regarded as worthless, although 75 per cent. of eight-year-old children pass and 97 per cent. of nine-year-old children pass, a good difference for two consecutive ages. IX 6 is mentioned as a particularly good test, while for nine years 60 per cent. pass and for ten years only 78 per cent. pass, a smaller difference between the two consecutive ages than in IX 2. Binet gives only a part of the figures that were used in making the 1911 revision of the scale.³¹ Those that are given show some striking differences, as regards the proper place of some tests, from the places given these tests in the revised scale.

We may next summarize briefly the more important comments that have been made on different individual tests which are not based chiefly or at all on any statistical data. This has already been touched upon above in pointing out some tests as illustrations that came under general criticisms of the system as a whole. The most extensive criticisms of this sort come from Decroly and Degand³² who tested only forty-five children with the 1908 series, but who have made a considerable study of the general problem of measurement of intelligence. They make the following observations:

Too easy—III 1, IV 2, VI 3, 4, 5, VII 3, 6, IX 6, X 4, XI 1, 3.

Too difficult—XIII 1, 2, 3.

Too mechanical—V 4, VII 7, IX 2, X 1.

Affected by training—III 5, IV 1, VI 6, VII 2, 3, 8, VIII 1, 2, 4, 5.

Too dependent on memory—III 2, 3, IV 3, VI 2, VII 5, XII 3.

Bobertag's general observations on individual tests indicate

³¹ L'Annee Psychologique, 1911.

³² Archiv de Psychologie, 1910.

similar criticisms, but, unfortunately for harmony, they do not affect the same individual tests. Omitting tests regarded as too easy or too difficult, which have already been considered for Bobertag's results, he points out the following:

Affected by training—V 4, VI 6, VII 2, 3, 7, VIII 2, 5, IX 1, X 1, 2.

Too mechanical—VI 5, IX 2.

Affected by chance—VI 7.

Affected by interpretation—VI 4.

Good tests—VI 1, 3, VII 1, 4, 8, VIII 3, 4, IX 6.

In revising the 1908 series Binet and Simon drop two classes of tests. These are:

Too mechanical—VI 6, VII 2, IX 2.

Affected by training—VII 3, VIII 1, 5.³³

A comparison of one author with another on this class of observations shows that there is but little agreement between them as to what criticism applies to what tests. This is particularly true of the criticism that training affects some of the tests. The reader will find it interesting, further, to note the tests any given author has designated as affected by training, and then go over the whole list in the system of tests and pick out additional ones that in his own judgment might logically be added on the basis of those the author in question gives. His disagreement with the given author will illustrate why the authors themselves disagree. As the writer has stated above and elsewhere, estimations of the value of different tests based on this sort of observations can in themselves have but little value. The concrete results, the relative number of normal children of different chronological ages, who pass or fail in a test can alone be the basis for a final decision on the value of a test. It is apparent by this time that even such results may from a variety of causes be misleading. Criticisms coming from other sources are important in pointing the way to questions that need figures to decide them, but beyond this should receive little consideration. It is partic-

³³ The term "Mechanical" is used throughout here as meaning that the test so described may be passed quite independently of the intelligence. The authors quoted do not all use just this term.

ularly unfortunate that in the use of the Binet and Simon tests apparently everyone has disregarded statistical results at times, and has even broken away from his own figures to criticise a test as poor or misplaced in the system.

C. Summary of Conclusions.

1. The procedure in obtaining statistics to show the degree of correlation between the chronological ages of normal children and their mental ages as determined by the tests has not taken sufficient account of the exact chronological ages of the children tested, nor adequately eliminated from the supposedly normal children tested those that were below normal or precocious, and has probably lacked necessary uniformity in ways of giving the tests and in interpreting the child's responses. We cannot conclude with certainty from these statistics that any given test is on the whole too easy or too difficult by a year if the discrepancy is not greater than this.

2. The tests for the upper part of the scale give the greatest irregularity in the results obtained by different examiners, and are on the whole probably too difficult. For certain fields of work great accuracy is especially needed in this part of the scale. It needs to be corrected, supplemented and extended at the upper end so as to give us a more reliable means of distinguishing between the normal and nearly normal for these higher chronological ages.

3. The scale as it stands may undoubtedly give frequent errors of a year in the mental ages, and more or less occasionally an error of two years. This degree of accuracy is greater than we can at present obtain in any other way for all but the lower part of the scale, except by prolonged careful observation of the individual child by a skilled observer.

4. A number of the individual tests have been shown, by the substantial agreement of the results of different writers, to be too easy or too difficult for the part of the scale in which they are placed.

5. One of the most immediate needs of the scale is a more thoroughgoing standardization of the tests, both as regards how each individual test is to be given, and how the results are to be

interpreted. This lack of standardization has brought in the personal and varying factor of the examiner, and is probably very largely responsible for the different results obtained by different writers.

6. The question of the effect of training on the value of a test of intelligence is among the most important. No test can probably ever be entirely free from such effect, but there are grounds for believing that it can be eliminated sufficiently for all practical purposes of accurate testing. We cannot determine from *a priori* considerations alone the degree in which any given test is thus affected.

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EDITORIAL

It is a pleasure to note the evolution of the movement to give a scientific interpretation to the vast store of biological, psychological and pathological facts available for study in our public institutions for feeble-minded and epileptic. It is a long jump from that first beginning of psychological studies by Dr. Wylie, while nominally serving as pharmacist at Faribault, to the world renowned work of Goddard at Vineland, Huey at Lincoln, and the brief work of Wallin at Skillman and Lange at Glenwood, and the systematic and intensive studies of Kuhlmann at Faribault. While the Faribault laboratory was provided in 1900 with a suite of seven rooms for research and clinical studies, including bacteriology and psychology, photography, lectures, etc., and all

modestly equipped with apparatus, Dr. Wylie's studies in sense reactions and ergograph readings were conducted between times when not filling prescriptions, and it remained for New Jersey to secure the full recognition of the department of research independent of routine administrative duties.

The increased opportunities for scientific research are a tribute to the foresight and breadth of mind of members of institution boards, who, while obliged to keep in close touch with public sentiment, are big enough to assist in educating it and thus securing support for research. The public can always be depended upon (1) to assist its afflicted members, and (2) to foster wisely directed investigations for causes of social defect or distress. While the public will not patiently support wasteful expenditures, it will always support and approve liberal care as against that type of economy that results in neglect of personal care. This it always condemns when the facts are known. So it will always support scientific investigation when there is a reasonable prospect that it will produce definite information as to how to lessen human affliction or social misery. It is to be hoped that this movement is now in the process of healthy and permanent growth, but to insure its continued support and preserve for it the confidence of the public, it is important that it should be conducted in a scientific spirit. It must be devoid of spectacular features and those who engage in it should have the patience to be thorough and critical, promulgating only truth.

A. C. Rogers.

REVIEWS AND NOTICES

Backward and Feeble-Minded Children. A Clinical Study in the Psychology of Defectives, with a Syllabus for the Clinical Examination and Testing of Children. EDMUND BURKE HUEY, Baltimore: Warwick and York, Inc., 1912. Pp. XII+221.

This work is the first fruit in book form of the realization of the long desired plan of placing an investigator upon the staff of our public institutions for the feeble-minded and epileptics, who could devote himself to pure scientific investigation, unencumbered by executive duties—the ever present handicap of the most enthusiastic superintendent.

The book is, as its sub-title states, "Clinical Studies in the Psychology of Defectives, with a Syllabus for the Clinical Examination and Testing of Children." It is divided into seven chapters of which one is devoted to the general Introduction, one to Classification and Terminology and two to Clinical Studies of Border Cases. These studies are selected from 140 cases examined by Dr. Huey according to the Binet-Simon tests out of the 147 received at the Lincoln State Home from November 17, 1909 to November 16, 1910. Thirty-seven clinical cases are given with 32 portraits. The cases are written up very clearly. The mental age, retardation, school performances, industrial accomplishments and disposition give the reader a good mental picture of each case—even without the portraits. The book will be especially interesting to teachers and from it the laity will get a better idea of the high grade feeble-minded than is usually supplied by the text books. One only regrets that Dr. Huey could not have spent a longer time in studies of a wider range of cases in the large population of the Lincoln Home, though, if only one group were to be selected for intensive study and only a few months could be devoted to them, no group is more interesting than the morons. The work done with them so far by all investigators of mental defect is but the preparation for a hoped-for better understanding of that still smaller group of young people, of about normal intellectual capacity and without psychosis, that seem to make failures in life. This book will give the laity a better conception of the problem.

The title, it seems to the writer, is rather unfortunate in that it suggests a general treatise on the subject of backward and feeble-minded children, although the sub-title correctly defines its scope. The work deserves a good circulation.

A. C. Rogers.

Some Fundamental Verities in Education. MAXIMILIAN P. E. GROSZMANN. Boston: Richard G. Badger, 1911.

The author offers this small volume as a companion to his book, "The Career of the Child from the Kindergarten to the High School." "It emphasizes," he says, "some of the arguments presented there, and endeavors to prove the fundamental value, in education, of the native instincts and tendencies of the child. * * * This volume also adds an experimental justification to the theory of developmental periods, or culture epochs of the child," etc. The author not only urges the training of the sense perceptions but makes very proper plea for motor training and emphasizes the educational advantage of art work "co-ordinated with all those activities and interests in which the children take their most spontaneous and deepest interest."

Children's original expressions of art compared with primitive art of peoples is a unique feature of the book.

A. C. Rogers.

Height and Weight of Feeble-Minded Children in American Institutions. HENRY H. GODDARD. *Director of Department of Research, Training School for Backward and Feeble-Minded Children, Vineland, N. J. Journal of Nervous and Mental Disease, April, 1912.*

A valuable contribution to the literature of the feeble-minded. The subject is fully presented by tables, curve charts and text, as the result of a study of 10,844 cases—5,923 males and 4,921 females, of ages from birth to sixty. These are taken from the population of nineteen American institutions. The conclusions are as follows:

The above figures seem to warrant the conclusion that we have a remarkable correlation between physical growth and mental development.

The low grade (idiot) has not only a disturbed brain function but his entire organism is disarranged and growth processes upset.

In the imbecile the same is true but to a less extent. In the moron we have the interesting phenomenon of practically normal growth during the immature years, but an arrest of growth earlier than in normals.

All defectives are heavier at birth than normals. This would once have been thought to be correlated with the defect through greater difficulty of birth necessitating the use of instruments with resulting injury. But in the light of our findings in heredity this is seen to be without force.

Sex differences are less and less marked as we go down the grades of defect.

A. C. Rogers.

Wasserman-Noguchi Tests. DR. CHARLES BERNSTEIN. *Seventeenth Annual Report of the Board of Managers of the Rome State Custodial Asylum at Rome, N. Y., 1911.*

Male cases tested, 570:

Positive	81 or 15.96 per cent.
Weak positive	172 or 30.18 per cent.
Very weak positive	108 or 18.95 per cent.
Faint positive	66 or 11.58 per cent.
Doubtful	36 or 6.32 per cent.
Normal	97 or 17.01 per cent.

Female cases tested, 330:

Positive	43 or 13.03 per cent.
Weak positive	122 or 36.97 per cent.
Very weak positive	48 or 14.55 per cent.
Faint positive	37 or 11.21 per cent.
Doubtful	19 or 5.75 per cent.
Normal	61 or 18.49 per cent.

In commenting upon the results, the doctor states: "If the technic of the test is right, positive and weak positive must be regarded as evidence of syphilis. This would give in this institution 46.14 per cent. of the male cases

and 50 per cent. of the female cases as syphilitic. One would expect a higher per cent. among the males and this would no doubt have been the result if the 300 male patients in Building J, had been tested."

A. C. Rogers.

Two Thousand Normal Children Measured by the Binet Measuring Scale of Intelligence. H. H. GODDARD. *Pedagogical Seminary*, 1911, Pp. 232-259.

Dr. Goddard reports here in full the results of examining 2,000 public school children with the Binet-Simon tests. The children were non-selected, none being eliminated for retardation or precocity. The tests were made by five assistants from the Vineland laboratory, who each examined from twelve to thirty children a day. Coaching of some children by others who had already had the tests was found to be of negligible influence, because "the child who had thus been told was found to be unable to retain what had been told him, if it was something that was beyond his normal mental age." In his main tables the results of 1,547 children figure, being those of the first six grades. To show the degree of general reliability of the system of tests as a whole he gives the following figures:

At													
Yrs. below age	7	6	5	4	3	2	1	age	1	2	3	4	Yrs. above age
No. cases	1	6	8	37	79	156	312	554	329	49	14	2	No. cases

The designation "at age" means children whose chronological and mental ages agreed. He next gives a table showing the distribution of the number of children of each chronological age over different mental ages. (This table is given in full in this Journal, this number, P. 115). He concludes that "The results could not arrange themselves on this curve * * * if the questions were not carefully graded. Secondly if they were not right, age for age, but were too hard or too easy, the largest group would not be one at age, but would be a year below or a year above according to whether they were too hard or too easy." To find whether the individual tests in the different age groups are all correctly placed he gives a table for the 554 children who tested at age, showing the number for each chronological age from five to thirteen that passed and the number that failed in each individual test from age group III to age group XIII, inclusive. For a test to be considered correctly placed seventy-five per cent. or more of the children of the corresponding chronological age had to pass it. On this basis, he regards the following tests as too difficult: VI 2, VIII 1, 5, IX 3, XII 3; and the following as too easy: VIII 3, IX 2, XI 2, XII 2. He notes further that "on the whole the results agree very closely" with those given when all the children are taken into account instead of only those who tested at age, but gives no further figures on this point. High School pupils and some adults were tested with the tests of age group XIII, the results indicating that these are too difficult, especially the first. A revision of the scale of tests

is offered, comparing it with the 1908 scale and also with Binet and Simon's 1911 revision. There are some important differences between the two revisions. On the whole he concludes that "The tests up to and including twelve years are certainly eminently satisfactory. Our proposed list for XV and Binet's 'Adult' must be further tested to see if they are of any value

* * * We need above all things a test for boys and girls beyond twelve years." The article includes also many other tables and deductions of important educational bearing which are not concerned with the tests as a means of diagnosing mental development.

The article is a most valuable contribution to our knowledge of the Binet-Simon tests. It supplies the data that we have wanted, especially for American children, and represents an undertaking that few have opportunities for carrying out. This fact should not be lost sight of in considering a number of minor criticisms which, at this later date, appear valid. (1) Some of the testing seems to have been done rather hurriedly. No examiner can test thirty children a day without a considerable risk of errors in the results because of haste. (2) The children tested should have been selected on the basis of some adequate standard of normality, so as to eliminate the precocious and the sub-normal. We cannot eliminate such cases on the basis of the results obtained with the tests themselves when the degree of accuracy of the tests in determining this very question is aimed at. (3) Fractions of a year in the chronological ages of the children tested seem not to have been taken into account. This procedure would also not be fair to the tests, as it would show much greater and more frequent variations in the mental ages of normal children than the tests really give. (4) The author's general conclusions are not entirely verified by his statistical data on which they seem to be based, but are more favorable to the tests than the figures alone justify. According to these figures the tests are not in general just right, age for age, but for six out of the nine chronological ages, from five to thirteen inclusive, they fit another age as well as they do the age for which they are given. This is not to be taken in the sense of a contradiction, but simply indicates that the author considers the tests as satisfactory and correct if they give an error of no more than a year in the mental ages. The reviewer cannot subscribe to this attitude as to what is satisfactory. We usually regard a thing as satisfactory only when it fulfills a purpose at least as well or better than anything else, and when we see no possible way of getting anything better. If for the lower part of the scale the tests made frequent errors of a year it would be a serious lack of accuracy, and we could undoubtedly devise tests now that would do better. An error of only a year in the upper part of the scale, however, would be much more accurate than anything else we have or can hope to get immediately. (5) In making his revisions of the scale the author follows neither his statistics nor his previous conclusions as to which tests are misplaced in the scale entirely. This discrepancy results in part from the fact that he changes the nature of the test or the procedure in using it so as to make it right for the place

in which he puts it in a few cases, and probably in part because other observations are taken into account. These other observations are not always given.

Faribault, Minnesota.

F. Kuhlmann.

Ueber Intelligenzspruefungen (nach der Methode von Binet und Simon). O. BOBERTAG. *Zeitschrift fuer angewandte Psychologie*, 1911, Pp. 105-197.

Over four hundred children were examined with the 1908 series of Binet-Simon tests, adapting them for German children. Their ages ranged from six to fourteen years, and were so chosen that their birthdays were always within two months of the time of the examination. Children with more than two grades behind in their school work were eliminated. About forty children were tested for each age. The author does not regard his statistical results as of great value because of the small number tested, and does not give them for many tests. The article is a valuable contribution because of the psychological analysis given in many instances and of the observations in connection with individual tests. In his general remarks he notes that in all mental tests a compromise must be made between exactness and applicability, and both must be determined through long empirical testing-out, not through *a priori* discussion. There are two things which can never be entirely eliminated. These are accidental, wrong results with individual tests, and a certain degree of arbitrariness in the procedure on the part of the examiner. It is the problem of experimental technique to reduce these to a minimum. Some of the Binet-Simon tests are of little value because of the degree in which both these factors enter. The statistical results are too incompletely given to show much in regard to the system of tests as a whole. But the comments on individual tests are of special interest because of the thorough and impartial manner in which the whole study seems to have been carried out. The following tests are regarded as poor because of the variable factor of the influence of training either in school or at home: V 4, counting four pennies; VI 6, giving age; VII 2, telling number of fingers; VII 3, copying written phrase; VII 7, counting thirteen pennies; VIII 2, counting value of stamps; VIII 5, writing from dictation; IX 1, giving date; IX 2, naming days of week; X 1, naming months of year; and X 2, naming nine pieces of money. The following are considered poor for other reasons: VI 5, execution of three simultaneous commands. Intelligence plays but a small part in this. VI 4, definition of known objects. The basic idea of this test is good, but accidental variations in results and necessary arbitrary procedure of examiner largely destroys its value. VI 7, distinction of morning and afternoon. The element of chance makes this worthless as a test. VIII 1, reading for two memories. Memory depends too much on the nature of the text and varies with individuals. XI 3, sixty words in three minutes, and XII 2, rhyming words. There is too much individual variation for these and are independent of intelligence. XIII 1, 2, 3, these

are too difficult and independent of intelligence. The following are pointed out as good tests: VI 1, showing right hand and left ear. More tests of this sort might be included. VI 3, aesthetic comparison. Similar tests for higher mental ages might be used. VII 1, incomplete pictures. This suggests Ebbinghaus' "completion test." More similar tests might be used. VII 4, copying a diamond. More complex figures for further tests might be used, unless individual variation in ability to draw entered too much. VII 8, naming four common pieces of money. A good test because the knowledge involved is a spontaneous acquisition, which is an important indication of intelligence. VIII 3, naming four colors. Good test for same reason as VII 8. VIII 4, counting backwards from twenty to one. IX 6, arrangement of weights. Naming nine pieces of money (X 2) is not regarded as a good test, while naming four pieces is (VII 8) because children do not handle the larger coins and have thus no opportunity to spontaneously learn their names.

Faribault, Minnesota.

F. Kuhlmann.

Das Farbenennungsvermogen als Intelligenzpruefung bei Kinder.

W. WARBURG. *Muenchener medicinische Wochenschrift*, 1909.

The author tested the ability of 1,800 children to name the following colors: Black, white, gray, red, yellow, green, blue, violet, and brown. For 1,104 he gives results in tables. Of these one group is from the "Volkschule" and another group from the "Hilfschule," thus comparing the normal with the duller children. Colored woollens pasted on cards were used, the child being asked to name the color. The following table, taken from his more detailed figures, gives the gross results.

VOLKSCHULE

No.	Age Limits	Av. Age	White	Black	Red	Yellow	Green	Blue	Brown	Gray	Violet	
334	6-13	9.46	100	99.7	96	90	79	78	53	36	30	Boys
336	6-13	9.54	100	99.7	97	93	86	85	58	48	42	Girls

HILFSCHULE

No.	Age Limits	Av. Age	White	Black	Red	Yellow	Green	Blue	Brown	Gray	Violet	
230	8-14	10.46	98	96	89	73	51	47	22	9	7	Boys
204	6-13	10.30	98	98	94	84	61	61	34	25	13	Girls

The figures are the percentages of the number of times each color was named correctly. It is seen that the older but backward children of the Hilfschule always do more poorly than those of the Volkschule, when averages are considered. This rule also holds on the whole in comparing children of any age with those of a year younger or older. Thus for the children of the Volkschule the percentage that name the colors correctly increases fairly regularly from one year to the next, when averages from about

fifty children for each year are compared. It is further noted that in any school the children who are regarded as the brightest by the teachers do best with the colors. In one instance in which the teachers divided a class into three grades according to their estimated intelligence, and the author divided the same class into three grades according to their ability to name colors the two classifications were found to be identical throughout with the exception of only one child. The author concludes that "if one eliminates colorblindness, considers sex, the environment and previous training of a child, one will not easily make mistakes in judging the intelligence of a child from his ability to name colors."

The article is of special interest for several reasons. The study seems to have been very carefully made, and the large number of cases should make the averages reliable. These averages show a rather remarkably close correlation between ability to name colors and age, or intelligence. On the other hand, this is a test that has been specially criticized as a poor test of intelligence because of the variable degree of training from one child to another. What seems to be true is that this would be a good test for diagnosing several mental ages, possibly from about five to ten, if the factor of training remained constant, or could be accurately allowed for in individual cases. But the difficulty lies in the fact that training in naming colors is not a constant factor, nor can we in any way allow for its effect in individual cases, because we have no means of determining how much of a child's ability to name colors is due to unusual training.

Faribault, Minnesota.

F. Kuhlmann.

Ueber Korrelation. Methoden der Korrelationsberechnung und kritischer Bericht ueber Korrelationsuntersuchungen aus dem Gebiete der Intelligenz, der Anlagen und ihrer Beeinflussung durch aussere Umstände. W. BETZ. *Beihefte zur Zeitschrift fuer angewandte Psychologie und psychologische Sammelforschung*, H. 3, 1911.

This is a critical and exhaustive study of the methods of determining correlations in the investigations on intelligence. It includes a bibliography of 102 references.

Die Prinzipien und Methoden der Intelligenzpruefung. TH. ZIEHEN. Dritte vermehrte Auflage. Berlin: S. Karger, 1911. 1-94 S.

This outlines and discusses some tests largely along the line of mental functions as usually recognized, such as "retention," "reproduction," etc. The tests are intended to determine the characteristics of these functions in different mental disturbances, including feeble-mindedness.

General Ability, its Existence and Nature. B. HART AND C. SPEARMAN. *British Journal of Psychology*, March, 1912.

The authors discuss different views as to the nature of general intelligence, and mathematical methods of treating results on correlation.

Vorlesungen zur Einfuehrung in die experimentelle Padagogik und ihre psychologischen Grundlagen. E. MEUMANN. Zweite Auflage. Leipzig: Englemann, 1911. Erster Band, XIX+725 S.

This edition is thoroughly revised and much enlarged. It will be completed in three volumes. The first volume is on the child, discussing the experimental investigation of its sensation, perception, memory, language, imagination, suggestibility, feeling, interest, attention, and other topics. It gives also a statement of the laws of mental development, and describes the methods of educational experiments.

Die Differentielle Psychologie in ihren methodischen Grundlagen. W. STERN. Leipzig: Barth, 1911. XI 503 S.

This latest edition of the author's well known earlier work under this title is entirely re-written. Features of special interest in the present edition are the third section on the "investigation of individualities," and classification of temperaments, and mental tests.

Handbuch der Erforschung des jugendlichen Schwachsinn. H. VOGT UND W. WEYGANDT. Jena: Gustav Fischer, 1911.

Anomale Kinder. L. SCHOLZ. Berlin: S. Karger, 1912. VI u. 448 S.

NEWS AND NOTES

The legislature of North Carolina, at its last session, appropriated \$60,000.00 for the establishment of a school for the feeble-minded. No provision was made for maintenance but a Board of Trustees was appointed. They have in turn elected an executive committee of which Dr. L. B. McBrayer, of Ashville, is Chairman and Dr. Ira M. Hardy, of Washington, is Secretary. The city of Kinston in the eastern part of the state gave 1,000 acres of land one mile from the city limits for its location and this was accepted by the board. The property fronts on the Neuse River and slopes back for two miles. From the building site to the river is a fall of some 40 or 50 feet. There is a good flowing well on the property. The Norfolk and Southern Railway and the Interstate Highway cross the grounds between the building site and the river. There is also a branch railroad connection by way of Norfolk and Southern to Snow Hill. Kinston is to furnish lights and water free for five years, on the condition that the state lay a water line to their pumping station. The Board has planned

to have the buildings completed, so far as their appropriation will permit, by the time of the meeting of the legislature in January, 1913. This information is furnished the Journal through the courtesy of Dr. McBrayer, Chairman of the Executive Committee.

The Journal has the following information concerning the new institution for feeble-minded in Denver through a letter from Chas. D. Griffith, one of the commissioners. The training school and home is to open about July 1st of this year. "Its scope will be exceedingly broad, as it will include all ages and all conditions of mental incompetency." One building for about 100 is completed. The commissioners are endeavoring to open this to children of from 5 to 14 years of age, providing this can be done under the organic act. The home is situated about 9 miles from Denver and within about five miles of the mountains—being a beautiful spot. The commissioners, Chas. D. Griffith, Thos. F. Daly and Benjamin Lowell, give their time to the organization of the institution without any compensation.

Dr. Aristides Mistres, of Havana, Cuba, writes the Journal that some of the people in Havana are showing an interest to do something for the feeble-minded along the lines of the work in the United States.

S. Spencer Page, Superintendent of Neglected and Dependent Children of the Saskatchewan Bureau of Public Health, writes that the three provinces of Manitoba, Saskatchewan and Alberta are proposing to establish an institution for the feeble-minded which they can use in common.



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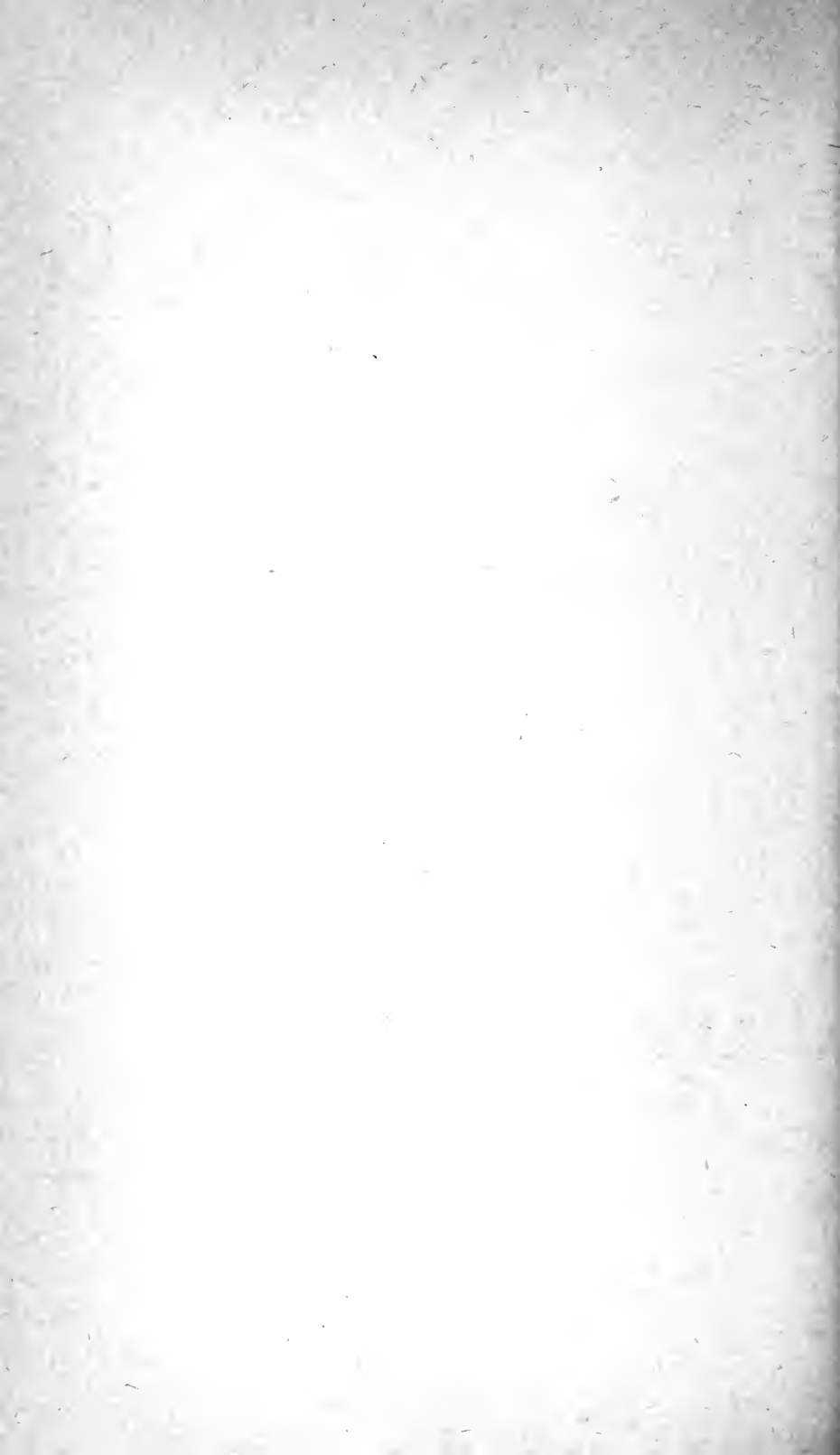
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THE FEEBLE-MINDED OUTSIDE THE INSTITUTION AND THEIR RELATION TO SOCIETY

BY C. H. HENNINGER, M. D., *Neurologist to the Children's Hospital; Assistant to the Psychopathic Department of St. Francis' Hospital; Assistant to the Allegheny General Hospital, Pittsburgh, Pennsylvania.*

I will not attempt to cover the field that the title of this paper would indicate. The object is to present briefly for discussion, a few observations made in hospital, dispensary and private practice, covering a period of seven years. In reviewing the case records, I find that I have examined over seven hundred children for mental deficiency. Of this number, 180 were feeble-minded, 48 epileptic, 157 backward. The remaining cases were classified as precocious, excessively timid, unstable and other irregular types, or normal. The majority of these cases were examined for the Juvenile Court of Allegheny County, or at the clinic for defective children connected with the Children's Hospital.

The feeble-minded constitute all grades and there is no essential difference between the feeble-minded outside the institution and those under your care. As to the etiology of these cases, hereditary mental weakness with its unfavorable environments and excesses, is the greatest factor. The relation of tuberculosis is clear and definite.

Nine of the 180 cases here recorded, gave evidence that syphilis had been the most important factor. The effect of syphilis is a much disputed point. Institutional statistics show but a small percentage where evidence of inherited syphilis is manifested, varying from 1 to 2.5 per cent. I am inclined to the

opinion that syphilis is a greater factor than clinical evidence would lead us to believe, as many defective children due to this cause die in early infancy or before they reach the institutional age and others have slight cerebropathies sufficient to prevent a normal mental development but give no clinical evidence of inherited syphilis. This does not indicate that institutional statistics do not present the conditions there existing or that this percentage would hold good in a larger number of cases, but is simply given as my own observation and is subject to revision when additional facts are obtained.

In the Journal of the American Medical Association, July 2, 1910, Dr. William W. Graves published an interesting article on The Clinical Recognition of the Scaphoid Type of Scapula and of Some of its Co-Relations. He has shown that it occurs most frequently in individuals deviating from the average in physical or mental endowments, or both, and states that the natural habitat of the scaphoid scapula was in the deviate. He has also shown the close relationship existing between this anatomical deviation and cases where syphilis has operated. Since reading this article I have examined my cases for the scaphoid scapula and have been surprised at the large number of defective children showing this deviation. As to its relation to hereditary syphilis, I have not as yet formed an opinion but its relation to the feeble-minded, regardless of the predisposing factors, has some bearing and should at least receive the same consideration as anatomical deviations elsewhere. While it may never be positive evidence, it is of value in arriving at a correct diagnosis and a better understanding of the defective evolution of these cases. Much has been written lately in regard to enlarged tonsils and adenoids as an etiological factor in the production of mental backwardness. The investigation along this line carried on at the clinic for defective children at the Children's Hospital would indicate that the presence of enlarged tonsils and adenoids did not play an important part. When present, they should be treated the same as diseased conditions elsewhere, but we should be guarded in our prognosis as to the child's future progress. As a factor in the production of feeble-mindedness it is of no

consequence. Infectious diseases, with their destructive effects on the nervous system through blood vessel alterations and direct involvement of the brain and meninges, produce many minor cerebropathies difficult or impossible to recognize from the clinical symptoms, but are nevertheless potent factors in the production of feeble-mindedness. I now consider them of greater importance than I formerly did and carefully investigate all cases giving a history of severe or long continued fever.

I believe that we are now in a better position to understand the relation of alcoholism to feeble-mindedness. Studying the cases from histories alone gave unreliable data, and often the fact that the father or mother was addicted to the excessive use of alcohol lead to the conclusion that alcoholism was the most important factor. In the light of recent investigation it seems that our statistics in this matter need revision. The study of alcoholic cases often reveals the fact that the individual addicted to excessive indulgence in alcohol is so as the result of an abnormal mental condition; that is, either by a disease that has destroyed his mental integrity, or a faulty evolution, and when these are combined with alcohol it is indeed difficult to say the exact proportion that we can attribute to each factor. Some pathologists say that they are unable to trace a direct relationship between alcoholism and arterio-sclerosis, (a long accepted belief); that its administration to animals over long periods does not cause arterial sclerosis even when injected directly into the circulation. But as to its effect on the offspring, we cannot prove beyond a doubt that it will produce feeble-mindedness. Recently several studies dealing with the effect of alcohol have been published by Professor Karl Pearson and his associates in the Francis Galton Laboratory of Eugenics in the University of London. The conclusions in regard to heredity drawn by these investigators are in substance that, "alcoholism in the parent does not *per se* result in deterioration of physique and mental powers of the offspring."

Through my connection with the Children's Bureau of Pittsburgh, I have come in contact with many of the child-caring agencies in Western Pennsylvania, and have found that all agen-

cies are confronted with various problems relating to the care of the feeble-minded. Practically all institutions where children are cared for have a certain percentage of feeble-minded who are unable to conform to the regulations of these institutions or compete successfully with normal children in their school work. They retard the work and interfere with discipline and should not be cared for in these institutions. The conditions that contribute to their admission and retention are many. The most important are the lack of opportunity and time for careful investigation or medical examination of all cases before admission, outside influence and misguided power of a political nature, requests for admission on account of religious preferences, the lack of knowledge on the part of relatives and friends in regard to the child's mental condition; also the hesitancy of parents to admit mental deficiency, the lack of general knowledge in regard to the institutions for the care of the feeble-minded, the indifference of the medical profession as to the outcome of these cases, their lack of interest so that often a correct diagnosis is not made and the case dismissed with some trivial comment about the future development as the child grows older and all functions are established.

Another phase of this work that has given us considerable concern is the number of feeble-minded women with one or more illegitimate children. During the past two months I have seen four cases, each having two illegitimate children. In all, the intellect was developed above the lower mean normal, yet they lacked judgment and ability to maintain a normal equilibrium. According to the general classification with the ordinary tests for mental grading they would all have been considered backward only, but in the final test, which includes the ability to conform to the laws and standards of the community, they fell so far below the normal that they should have been classed with the feeble-minded and so treated long ago. The majority of children here referred to were below the normal. The attitude of the public has been that such women should get married, but they are now insisting on examination, and where mental deficiency is found, that the woman be sent to institutions. It is

true that the remedy was applied late in these cases, but it shows an awakening and that the condition, bad as it is, is still better than if they had been married and raised large families when the problem presented by the above cases would not have been solved for generations to come.

Medical inspection of all children in our public schools denotes progress and will ultimately result in great benefit. Gradually the feeble-minded are receiving more consideration and are being separated from normal children, but there still exists a great deal of confusion in regard to the differential diagnosis between the feeble-minded and the backward child. The measuring scales of intelligence, the Binet and Simon tests and the De Sanctis tests are of distinct value. In examining children of the early school age the tests used by Dr. A. H. Hogarth, with certain modifications to suit the individual case, are, on account of their simplicity and brevity, a valuable aid to those engaged in this work.

Admitting that we have tests that for all practical purposes are sufficient to grade the child's intelligence, we are still far from a solution as to what is best for the child, and it is impractical to grade our backward and feeble-minded children from these tests alone, as they do not give us information as to the underlying causes. At least two-thirds of the backward children have the same etiological factors as the feeble-minded and the majority of cases are mild cerebropathies which have partly recovered. This class of cases do not respond readily to educational methods and should not be graded or cared for in the same manner as children backward in their mental development the result of physical defects, such as defective nutrition, vision, hearing, etc. The physical defects when found in backward children whose etiological factors are the same as the feeble-minded, are only other evidences of a defective evolution and do not give the same results when corrected. The cases of backwardness due to faulty environment, that is, lack of opportunity for normal mental development, need no consideration here, while the most confusing type of mentally defective children are those we must classify as precocious, excessively timid, irrita-

ble, eccentric, unstable and other irregular types that show marked deviation from the normal, but whose intellectual development is equal to or above that of the normal child. Among this class intellectually superior people are often found. They frequently develop to a marked or abnormal degree along certain lines, are productive to the highest extent and have added much to our sum total in knowledge, arts, inventions, etc., in spite of their peculiarities. While it is true that in later life these individuals frequently suffer from various forms of mental disease, such as psychasthenia, hysteria, paranoia, dementia praecox and various forms of affective psychoses, nevertheless it is not advisable to be too definite in our statements in regard to their future states, as all the etiological factors are not understood, nor are they revealed by physical examination or psychic analysis, no matter what our methods may be. And the same is true of a large number of backward children. We must not lose sight of the fact that a backward child with good judgment and observation, and with a normal moral sentiment has a fair chance of successfully competing with the average individual, regardless of his inability to maintain his grade in the public schools. We are all familiar with this type and have seen their rapid rise in the financial and business world.

With the defective child in Juvenile Court, we are at once brought face to face with delinquency, the result of mental deficiency, and the child's responsibility, or rather the child's needs. It is here we meet the problem of the degree of mental deficiency and responsibility and what should be done with the child.

The theories in regard to mental responsibility are, first, the "two block" theory, the unmedical theory that an individual is responsible or is not responsible; that he is either sane or that he is insane or feeble-minded. They do not admit of limited responsibility. They will not admit that the individual's mental integrity can be only partly impaired, that he can be semi-insane, backward or semi-responsible. There is, I am happy to say, a tendency to break away from this theory, at least in our dealings with defective children in court. According to the

"single block" theory, humanity, as a whole, consists of only one block. From the most intelligent to the least intelligent, from the most responsible to the least responsible there is a continuous gradation. Every body is sane in a different degree or every body is insane in a different degree, or, as the Quaker expressed his opinion to his wife, "Mary, the whole world is queer except me and thee and sometimes I think that thou art a little queer." Or, we are all feeble-minded if you raise the standard high enough.

The sensible way to look at this subject is that most people are normal. No one will deny the existence of the insane, epileptic or feeble-minded, but we must recognize also the semi-insane, the backward child and the semi-responsible. In court, with the feeble-minded, epileptic and insane, the problem is solved when their mental state is established. But with the semi-responsible it is indeed difficult to indicate the line of care and treatment that will give the best results. Taking into consideration the great difference in intellectual, moral or emotional development of the feeble-minded, their lack of appreciation of the consequences of their actions, it is not surprising that the crimes committed are of all degrees, dependent on the intensity of desire and the degree of development of their instincts. But their mental weakness is revealed in their lack of motives, the means and methods employed, or their total abandon to passions, excesses, etc.

The epileptics have received much benefit from colonization, careful supervision of their diet, appropriate exercise and medical treatment. There can, however, be no serious objection to caring for the epileptic whose disease has produced mental enfeeblement or perverted normal development in institutions for the feeble-minded. There is a class of epileptics having but few convulsions and showing no lack of mental development that should not be removed from desirable homes and the public schools and should in no case be institutionized. It is true that they run certain risks in regard to personal safety, but so long as this risk does not endanger the lives of others they should not be removed from society.

Children having speech defect frequently respond in a surprising manner to careful treatment to remove this defect. They not only respond in the matter of learning to talk, but their mental condition shows rapid development. This does not always remove them from the class of imbecility, as can readily be demonstrated by the degree of mental development that the high grade imbeciles are able to receive. The question as to whether they have reached a normal mental development can only be answered by their actions when thrown on their own resources.

With the hope that the number of feeble-minded born be limited to the minimum, several measures have been proposed that have given rise to considerable discussion. The unsexing of the feeble-minded does not appeal to me for the following reasons: The most dangerous cases are those whose mental condition has not been recognized and therefore would not come under this provision. It could only be carried out successfully in institutions for the feeble-minded. The operation would not remove them from this class and they would still require institutional care. There would be a greater objection to sending high-grade imbeciles to institutions having this power. The unsexed undergo certain changes in metabolism, have less strength and resistance to disease, consequently their lives would be shortened and we have not the moral right to lay any additional burdens on this class. Medical examination before the issuing of marriage certificates has been suggested as a means for preventing many social evils, among them the propagation of the unfit. While a law of this nature would no doubt be a step in advance, yet its value as a means of diminishing the birth-rate of the feeble-minded is questionable. The ordinary medical examination as carried on under such provisions would not reveal the mental state of the most dangerous cases. The diagnosis of epilepsy without the history of convulsions or the opportunity of seeing the applicant suffering from an attack, would be impossible. Would such an examination prevent the unfit from giving birth to children, even though the marriage certificate were refused? I have no hesitation in answering this question in the

negative, especially referring to the four cases already mentioned as feeble-minded women with illegitimate children.

It is indeed fortunate for the race that those individuals deviating from the normal to but a light degree, have a tendency to revert to the normal type. While the lower types tend to sterility. Thus, in maintaining a normal equilibrium we have many natural provisions to aid us. The feeble-minded outside the institution, being unable to direct his efforts to advantage or to conform his actions to the laws and customs of the country or society in which he lives, is a foreign element regardless of financial or social conditions.

The solution of this entire problem is not fantastical or spectacular. It is built on a solid foundation and carried forward by strong hearts. The work that you are doing in the institution for the feeble-minded is the only remedy needed. All that is required is that you be given power to say when a child should be discharged, and that you be given sufficient means to care for all applicants. And no one familiar with child work and the great relief to a community that the care of this class gives but will agree with me that you should be given this power and the financial means. Saying that you hold the entire solution does not imply that you have done all you can. The medical profession as a whole and the general public are not familiar with your work. They do not understand the object of teaching this class if they cannot be made normal. They scarcely stop to consider the fact that by institutional care you are greatly diminishing the propagation of this class. In fact, the majority of people still believe that you are trying to cure the feeble-minded and are not succeeding to a marked degree. So I wish to make a strong plea for a wider publication of your work and the problems that you are solving.

While the Journal of Psycho-Asthenics is an ideal publication and no doubt fulfills all the functions for which it is published, nevertheless many of the papers read, many of the problems solved should receive a wider distribution, especially among the medical profession, school teachers and all individuals interested in child work.

A CONSIDERATION OF FEEBLE-MINDEDNESS*

BY FREDERICK J. FARNELL, M. D., *Neuro-Serologist, Butler Hospital; Neurologist to the Public Schools, City of Providence, Rhode Island; formerly Assistant Physician, Manhattan State Hospital, New York.*

An exhaustive treatment of feeble-mindedness will demand more time and space than the present paper may give. At best, this thesis will attempt to give (1) only the briefest possible survey of the problems so far as is presented by the schools of Rhode Island, (2) some definitions suitable to the requirements of this thesis, (3) possible fields where feeble-mindedness flourishes, and (4) some practical points of more or less moment.

Naturally enough, the first steps to study, to examine, to classify, and to treat feeble-minded persons were begun in Europe. The work there accomplished has been highly interesting and has effected noteworthy results, an investigation of which will be well worth the pains. For our present needs it may be sufficient to mention that in Europe little or no constructive work was begun before the seventeenth century and in America not before the nineteenth century. New York, Massachusetts and New Jersey entered the field early to meet the problems of feeble-mindedness through proper institutions, schools and hospitals.

Rhode Island, it must be confessed with regret, had done little or nothing before 1908 when it established the school at Exeter which to this day houses only fifty persons. For want of a better place, our idiots and imbeciles are lodged at reformatories, poorhouses, or hospitals for the insane. Fifteen years earlier (1893) some attempt was made to inaugurate a special class in Providence schools for children requiring special discipline. In these classes were indiscriminately grouped all children apparently not normal and for whom graded classes in education were not adapted. Praiseworthy as the motive for such

*Read before the Butler Hospital Nurses' Educational Society, Feb. 4, 1912.

segregation was, the results fell short of the mark and necessarily so because they failed to meet the individual needs of those thus separated. In fact, it soon became evident that some of the children most troublesome and unruly were really mentally deficient and needed care and instruction quite distinct from such as a disciplinary class would provide. Moreover, the discipline, instruction, and physical exercise necessary for bright, healthy though mischievous children were ill suited for the slow, the feeble, or the dullard. Hence, in 1896, the first special school was instituted for those whom it was hoped could be beneficially reached through remedial agencies. Notwithstanding the fact that Providence was in this one department a pioneer, we are to-day far behind other cities and states in our care of these hopeless individuals, quite a pathetic commentary indeed on our civic pride and on Christian ideals. The situation which presents itself to us to-day demands attention for the earliest possible relief.

A few terms should remain clearly defined if it be our hope ever to do useful and efficient work among defectives. The definitions I offer are not exhaustive, and, in some respects, may be arbitrary. With some hesitancy I venture to ask you to grasp through a brief and very inadequate explanation what I mean when I speak of the idiot, the imbecile and the constitutional inferior. We usually associate the idiot with some malformation of the head, of the "sugar-loaf" kind. Since Lombrozo and his studies on criminal anthropology, too much stress and emphasis have been laid on the relation between physical characteristics and malformation on the one hand, and intellectual and moral deficiency on the other. There can be no doubt that phrenological extremes may account for some intellectual weakness. But it must not be driven too far. Socrates, the great intellect of ancient Greece, is said to have had a decidedly "sugar-loaf" head, showing that physical peculiarities may be shared alike by the genius and by the deficient. Notwithstanding this there are, in general, certain physical characteristics that do immediately attract the attention of the expert and put him on his guard to use them as symptomatic possibilities. Some of these are very

large or very small heads, Mongolian defects such as an obtusely rounded head, an upward slant of the inner droop of each eyebrow, short nose, dwarfish figures; or the amaurotic type including complete flaccidity of limbs, blindness and sleepiness. Moreover, any child that does not make the usual varied infantile noises, that does not grasp at bright and moving objects, that does not evince excitement at the sight of food and parents, that does not kick out its legs, and that does not, at the age of twelve or fourteen months, produce sounds which contain a vowel and a consonant the harbingers of word formation, suggests decided evidence of congenital defects.

But physical defect is conclusive evidence of defectiveness only when there is an accompanying psychic deterioration. Which is cause and which is effect does not concern us here. We may leave that to the societies whose special province is the study of the more technical phases. What in general we must prove is that there is a parallel physical and psychic disturbance, of which the psychic disturbance is by all odds the more important and far-reaching. Because of this psychic abnormality the idiot may be regarded as a "peculiar boy" to use the English paraphrase of the Greek word, or, what is even better, to use the authoritative statement of the Royal College of Physicians, of London, that he is "A person so deeply defective in mind from birth or from early age that he is unable to guard himself against common physical dangers." In popular usage the term idiot and imbecile are confused and frequently treated as synonymous. This is unscientific and somewhat hazardous. Some authorities grade their imbeciles according to the degree of the physical defects accompanying mental disturbance. The stigmata of an imbecile are usually minor physical abnormalities such as a high V-shaped palate, irregular set teeth, lobes of ears confluent with the cheeks. Imbeciles are usually under-sized but rarely show the gross physical defects seen in idiots. Many imbeciles present absolutely no noticeable physical defects, and to all appearances are physically normal individuals. It is here that the dominant psychic difficulties are important for diagnosis and to this I will refer later.

The imbecile may be regarded as one "needing a staff." The Royal College of Physicians, of London, defined him as "One who by reason of mental defect existing from birth or from early age is incapable of earning his own living, but is capable of guarding himself against common physical dangers."

The above two classes belong to the coarser grades of defects in contradistinction to the constitutionally inferior person who evinces a selective disturbance. Constitutionally inferior persons are to be divided into two classes—the psychopathic inferior and the pure constitutional inferior. Psychopathic inferiority is a phrase used very promiscuously amongst psychiatrists but restricted in its connotation by Professor Adolph Meyer, of Baltimore. Physical defects in them are usually absent. There is outwardly no evidence that would suggest inferiority. With them psychic difficulties are dominant and far-reaching and only through these psychic disturbances may one arrive at under-lying abnormalities. Psychopathic inferiority includes those persons whose mental organization appears asymmetrical because of excess or diminution of development in one direction or another. These unbalanced, or better, ill-balanced individuals are intellectually bright but have twists in their mental makeup. The pure constitutional inferior, or second type, present a more general and uniform deficit in mental endowment and a noticeable restriction in their intellectual capacity.

Our nervous system is the climax of evolution. Much attention and patient training are needed to enable us to cope with the difficulties of our existence. It behooves the machinist to find out the weaknesses, faults, and extent of his machinery by means of which he hopes to turn out goods with profit. So it is in our case—an adequate knowledge of the weaknesses and limitations of the mind of the individual is necessary that props and balancing material may be available at the proper time. It will, therefore, be profitable to consider the nature of the structure in which feeble-mindedness developes, because the props and balancing scaffolding necessary for proper growth have been lacking. It may be well to bear in mind that through the

lack of props and scaffolding different parts of the human complex organism may be afflicted. The basic causes of disturbances are more or less the same. Heredity and environment are powerful agencies as factors in defects. The terms heredity and environment have become horrible scientific slogans often doing more harm through fright and fear than good. We all have inherited various imperfections; no organism is absolutely perfect. Therefore we, especially when these circumstances are unfavorable, revert to lower grades of culture. For example, I have in mind a child whose father is dead and whose mother is compelled to work to earn their livelihood. The child, therefore, lacks the necessary supervision and moral guidance of instruction. Consequently the child runs about the street and when not in school associates with undesirable people, acquires vicious habits that lead to petty crime, and later to more serious crime which finally lands him in the reformatory. Heredity can hardly be said to have been the cause of his trouble. On the other hand, should both parents be imbeciles, the offspring will be imbeciles, such as a patient of mine whom I will designate as K. K., a girl of sixteen years whose intellectual level was reached at the age of seven. Her father was an imbecile with epilepsy and chronic alcoholism; her mother was a middle-grade imbecile of the ignorant type, and after many unsuccessful attempts to give birth to children she finally produced this girl, a low grade imbecile now residing in a convent. I have also in mind a patient, L. S., a girl of twenty-one years, whose father and mother were markedly alcoholic, and whose maternal aunt was insane. This girl was always an inferior, although specific alcoholism and mental derangement were pronounced later in life.

Epilepsy in the stock is often the cause of taint in the offspring. If one parent is an epileptic and the other feeble-minded, the offspring will usually be epileptic or feeble-minded. For example, see the case in Chart 1.

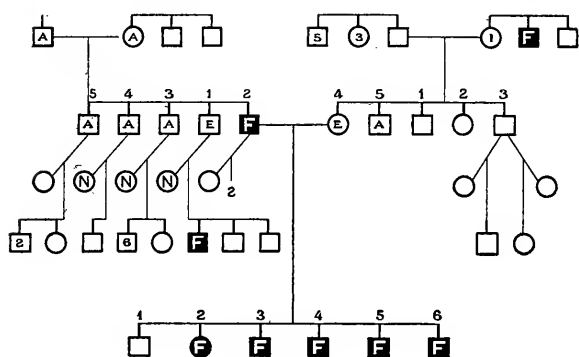


Chart I

Syphilis, in the parent, more especially if untreated or poorly treated, is frequently a definite cause of feeble-mindedness in the succeeding generation. Pathetic as it may sound, there is none the less much truth in the quibble of the French wit when he said "Civilization is often syphilization." I have in mind a patient, W. K., a boy of nine years, a hopeless idiot, who was referred to me for permission to enter school. The father shows signs of old syphilis and is markedly alcoholic; the mother is an ignorant Portuguese woman who had two children, both idiots. Another is due and probably will follow the same course.

Hard as it may sound, and objectionable, as it may be from many angles, one is often tempted to believe that to protect society the question of sterilizing those who will produce such unwholesome, incurably unwholesome seed is worthy of profound consideration. Though I, myself, am not prepared at this moment to state how far and upon whom such sterilization could or should be imposed, I can not refrain from stating that there is some justice with the defenders thereof.

Those who are interested in theories and the play of heredity I refer to the works of Mendel and to authors who have commented upon, applied and amplified Mendel's laws. The Mendelian law will explain the process of heredity on my patient, H. F., whose mother and father are normal individuals as far as could be ascertained. The oldest child, a girl, is normal

in all respects. The next child, now dead, was an epileptic boy. The third child, now in the almshouse, is an idiot. Then comes my patient who is an imbecile; and last, another child, also an imbecile. These traits are believed to have come from the ancestors, were recessive in the parents who appear normal, and became actively dominant in all of the children except one.

There are, in addition to heredity and environment, other forces that militate to start a line of defectives. These are trauma or injury due to prolonged labor, delivery by instruments, and other forms of accident. For example, my patient, H. M., a boy of seven years when I saw him. He showed stigmata of an imbecile in addition to which there was paralysis of both legs and arms which gradually improved and permitted usefulness. He presented the physical traits and mental characteristics that evidenced a reversion to animal instincts. He ate dirt, rolled in the streets, wet and soiled himself, etc. His history imparted the information that labor was hard, instruments were used and the mother states his head was large. The forceps produced a trauma to the coverings of the brain which already exerted a slight pressure with the accompanying physical defects mentioned. Forceps produce a larger number of defective children than physicians and naturally the layman will admit.

Diseases also act as inciting factors to produce in children defects which, in many cases, are but biological inactivities often amenable to treatment. M. F., a girl of ten years, was dull, stolid, inactive, and could not talk or walk until six years old. She was extremely fat and soggy. During these six years she was considered a hopeless idiot. At the age of six she was recognized as a cretin and treated accordingly with marked improvement in both physical and mental health.

H. C., a boy of nine years, was referred to me for permission to enter school. He was dwarfish, presenting a pug nose, high frontal arch, irregular teeth, very short legs and arms in comparison with the body, but without any evidence of hydrocephalus, infantilism, or idiocy. His condition is one of achondroplasia and is considered a prenatal ossification of bone.

Many of the dwarfs seen at side shows and circuses belong to this type of biological inactivity. Rickets, a disorder of nutrition, always affects the bones, rarely occurs congenitally. Its physical and mental symptoms simulate cretinism and achondroplasia, but careful examination and at times x-ray photographs will rule out all but the ricketic process. Here also correction of nutritional disturbance will improve the mental as well as the physical condition.

At this point I wish again to refer to Mongolian idiocy because it is frequently confused with cretinism, achondroplasia and rickets. These cases belong to the coarser grades of mental disturbances and are usually institutional cases. I am indebted to Dr. Ladd, of Exeter, for the permission to photograph, x-ray, and examine his only case of Mongolian idiocy. In the course of my examinations I have come across a few cases in which malnutrition alone appears to have been the disturbing factor. Children need food, plenty of food and good food. There is always a limit of underfeeding beyond which it will be dangerous to go. A striking illustration is that of a young boy of eleven years, P. O. B., who is the son of a teamster—one of twelve children. His mother died several years ago. Of the twelve children, seven have died and the remaining five are frail, peevish-looking creatures. In addition to insufficient nutrition and lack of care, the results of this impoverished home, there are marks of degeneracy and pulmonary tuberculosis. The child was brought to the laboratory of this hospital by his sister. He attracted my attention by his powers of observation. In spite of his neglected appearance he seemed quite bright but rather reluctant in expression. His palate was high and V-shaped, his nasopharynx was obstructed by tonsils and adenoids, and there were signs of acute pulmonary tuberculosis. In analyzing his personality I found that the boy presented some memory difficulty, but showed no impulsive, jealous or resentful tendencies. He was active at play, would like to be a leader rather than be led, but found trouble in overcoming difficulties. There is no evidence of predementia and signs of an imbecile constitution were not prominent. At all events his person-

ality being such as it was, when coupled with environmental and physical disturbances, could only condition an unfavorable future. Physical deterioration had already set in. If this boy should be freed from the degenerating effects of his environment, relieved of his physical defects, namely the tonsils and adenoids, given the right kind of food, subjected to satisfactory educational influences, it might be possible to inhibit the further progress of deterioration and even to overcome the mental, and, sooner or later, the moral retardation which is bound to follow.

In one sense the great disorganizer is puberty. Given any difficulty and puberty will exaggerate and enlarge it. During the process of change, many fail to react properly. Character is as easily unmade as made. Stanley Hall properly says, "Destructive energies are now vented, there is a passion for creating trouble by mischief, a great cleverness in concealing faults by lies, no natural affection and no conscience, yet even these cases, after the troublesome period of transition is passed, often settle down to respectable and fairly decent lives." Fuchs has also stated, "While the stage of puberty is revolutionary for normal persons, it is still more so for defectives; idiots animalize, imbeciles become violent, egotistic, coarse and vulgar, and the weak-minded grow unsettled in their normal feelings and are without resistance to sensations that now erupt within them." There are many children, though normal before puberty, who are found wanting at this period of stress and storm. At puberty, or with puberty, their intellectual development ceases, they become dead weights and indications of complete docility are evident. Many cases of imbecility first begin to show their symptoms then and a large group of poorly differentiated and indefinitely grouped cases present types of peculiarity which undoubtedly play a great part in the abnormal constitution of later years. Somnambulism, terrifying dreams, emotionalism, irritability, the tendency to be easily upset and other vagaries are frequently complained of. The child often presents traits of an epileptic constitution, evidence of predementia, hysterical, psychasthenic, and so-called neurasthenic signs. Formerly it

was accepted doctrine by all specialists that to have a defective individual a lesion must occur in the brain. During the last ten or fifteen years the fallacy of this assertion has become pronounced. The accepted theory to-day is that even without brain lesion a feeble-minded individual may result from biological or psychological disturbances either at or after puberty. For example, a boy of fourteen years was referred to me by Dr. Chapin, Superintendent of Health. For many months he had been unable to remain at school because of attacks of phobia as fear of death, a fear of fire, etc. The setting of his ideas and the peculiar reaction to them tabulate him as one mentally at fault, incapable of proper adjustment to his environment and forecast the condition known as *dementia praecox*.

Another case: R. G., at examination, was a girl of eighteen years. Since puberty she has had disturbances in her internal secretions with an accompanying enlargement of the thyroid. These faulty biological processes stimulated both physical and mental disturbances which rendered her unable to adjust herself to her surroundings. Under proper care and treatment both conditions have righted themselves and to-day she is a normal girl.

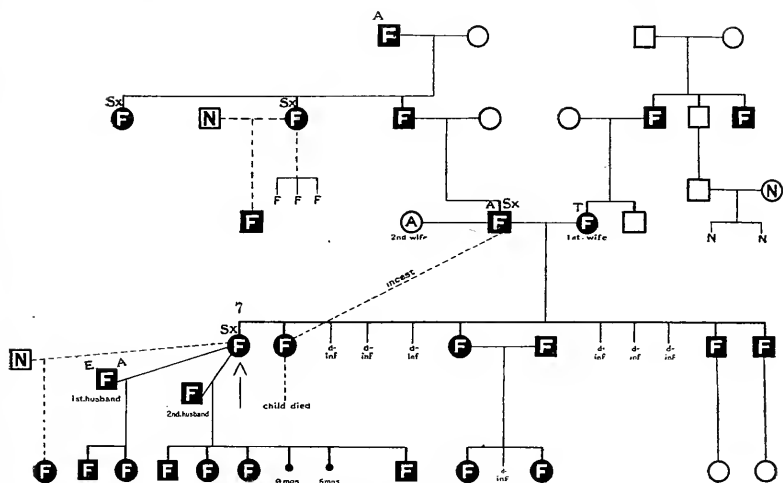
One thus sees that the "germ" is there and puberty with its wrenching and strain presents and exaggerates the flaw, and though secondary, must none the less be regarded as a field of feeble-minded. As with an engine or other machinery, it is never known and never can be known until the test. The explosion comes, few can know why or how. The efficient designer or mechanic, and the expert might have foretold—he was either silent or not interrogated.

The question then arises, how are we going to meet these problems? In one sense it is largely a public obligation, therefore we need institutions. But institutions can not hope alone to cope with the problem confronting us. Many never get into institutions. People are diffident and distrustful, if not fearful and ashamed of such family skeletons. The study of imbecility teaches us that if individuals only find their level and remain there there is no danger of complication or future disturbance.

But if nature is not kind enough to take away temptations and at the same time withholds the capability for adjustment, we find graver disturbances following. The importance of timely studies lies in the fact that it yields the possibilities of detaching in their early stages those individuals and psychological reaction types from which not only the feeble-minded and defectives, but also the insane and criminals arise. Trained public servitors, therefore, are necessary. Physicians with special training to diagnose the cases are pre-eminently needed. To make possible an early diagnosis physicians might be appointed to examine children systematically. Preliminary studies and methods have been published, notably by Professor Binet, of Paris, Professor Schlopp, of New York City, and Dr. Steward, of London, and others. The results thus far have only been preliminary; some lay emphasis on the physiological tests, others on the biological causes, and others again on the psychic investigations. My own work is a synthesis of all investigations I could gather, modified and amplified by my own experience.

After the physician, whose duty it is to diagnose and to prescribe, the great and crying need is for trained nurses, or capable volunteer or paid workers. For obvious reasons the trained physician can not get around as often as he would like. The quick, alert, intelligent nurse will be an able substitute. Upon admission to homes she will quickly detect a wrong, a defect, and will immediately set herself to help, through remedies at her disposal or through counsel. She will urge parents to be open and communicative, or if they be unwilling or unable to give the needed information, she will ferret out one who can and will shed light on the family history.

I have a chart showing the results of a capable social worker in examining a family tree. This chart shows excellently the hard and conscientious attention of the assistant who traced out defects in one family and produced an exceedingly illuminating piece of work which others like-minded might do in similar conditions, thus saving time and preventing mistakes.



Beginning with the girl 7 (over the arrow), while unmarried gave birth by a normal man to a feeble-minded child; her first husband was an epileptic, alcoholic and feeble-minded, by whom she had two feeble-minded children; her second husband was also feeble-minded, by whom she had five feeble-minded children and two still-born children. She had four feeble-minded brothers and sisters, one sister having a child by her own father who was feeble-minded and alcoholic. Another sister married a feeble-minded man and had two feeble-minded children. The girl's mother was feeble-minded and so also were two maternal uncles. On the paternal side, one paternal aunt had three illegitimate feeble-minded children.

(From "Heredity of Feeble-mindedness," Dr. Henry H. Goddard, 1910).

At best, these two servitors, the physician and the nurse, should work hand-in-hand, and their efforts should supplement each other. In an ideal state a hospital school would be established where special investigation can be made by physicians; provision made for training the nurse and the child; where needed discipline may be exercised in some cases; where kind and corrective treatment may be pursued in others; where levels of capacity, education and readjustment may be ascertained. Physical culture and speech classes should be made a part of its routine. Such a hospital school would, it is believed, do away with the distressing conditions found in most institutions where these individuals are treated as a class and not as individuals.

In dealing with defectives, with the feeble-minded, the essential thing is that, as with all nervous disorders, each must be treated individually. Special care in the selection of teachers should be shown, a course in life habits should be established with provision for amusements and diversions. The object of such a school, in short, is to bring a healthy turn to the education of the feeble-minded. In the light of most recent experiments with the feeble-minded, and in the light of the marvellous results in their condition, we should be wary of regarding their defects merely as nature's method of weeding out the unfit. In one sense the problem is an institutional one. But institutions as such may never be able to cope with the problem because of their vast dimensions. The problem, therefore, becomes one of social importance that should not be ignored. Ignorance about the conditions of the feeble-minded, and preconceived notions must yield; for these are stumbling blocks to all social and intellectual advancement in the line of inquiry. And ignorance and preconceived notions, it seems to me, can best be met by a hospital school properly founded and maintained.

Until we be fortunate enough to possess such a hospital school the physician and nurse must all the more necessarily work hand-in-hand. To the physician may be left diagnosis and treatment, and into the hands of the nurse is placed the great privilege of caring for the feeble-minded. Even now the nurse should be, and often is, the necessary link between the school and the home by being instructor to parents, pupils and teachers. The district nurses, especially, have additional obligations to be open-eyed. They enter homes never otherwise reached by the general practitioner or expert. It would be well could they scent disorders. They ought to ascertain and provide themselves as far as possible with the family history when a disorder is noted, and at the first possible moment to get in direct touch with an examiner for proper direction and instruction. As nurses, your talent, your training, your tact, should be brought to bear upon the difficulties and the diseases you may encounter, and your reward may be an improved community in that you have been watchful and helpful.

THE BINET AND SIMON TESTS OF INTELLIGENCE IN GRADING FEEBLE-MINDED CHILDREN*

BY F. KUHLMANN, *Faribault, Minnesota.*

In a previous article, the present status of the Binet-Simon tests as indicated by the results and criticisms of various writers was outlined in detail. Our object now is to present the results obtained in examining the inmates of the Minnesota School for Feeble-Minded and Colony for Epileptics so far as they throw any additional light on the value and accuracy of these tests in grading feeble-minded children. The authors' 1908 series of these tests was used throughout, just as given in my account of it in this Journal, 1911, with a few exceptions to be noted later. We shall be concerned chiefly with two questions: (1) The question as to how correctly each individual test is placed in the series and belongs in the age group in which it is found. (2) The influence of chronological age and training on the tests as means of measuring intelligence. The first is obviously fundamental in examining any class of children. The second is of special importance in examining the feeble-minded, since their greater chronological ages in general has afforded them much more opportunity for training and various acquisitions than the younger normal child of the same intelligence has had.

A. Accuracy of the Individual Tests.

1. Methods of Determining Accuracy. The series of tests is intended to represent a scale of increasing difficulty in the tasks the child is asked to perform in the tests. There are several ways in which one may proceed in determining whether each test is thus properly placed in this scale, and represents the intelligence of the average normal child of the age indicated by the age group in which the test is found.

(a) The most obvious way is to try the tests on large numbers of normal children of different chronological ages. Since

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normal children of any given age vary considerably in intelligence in both directions from an average, testing only a small number of children will not suffice, and a correct test will in a given percentage of instances give apparently incorrect results because the children tested in these instances are above or below average normal though still normal children. In order that the result may be reliable two conditions must be fulfilled. First, we must be certain that the children tested are all really normal children, which presupposes that we have some other method of determining intelligence through which we may check the accuracy of the present tests. It has been suggested that school children who are up to grade in their school work, neither advanced nor retarded, according to their chronological ages may be regarded as normal children. This assumes that the tasks set by the schools are for practical purposes in this connection accurate enough tests of intelligence, and that children are never in grades for which they cannot do the work. The latter part of this assumption is hardly always true. Secondly, the children tested must be exactly of the chronological ages indicated, and not five and a half or nearly six when they are called five, for example. As was noted in the article referred to above, neither the authors of the tests nor any of their critics, with one exception, have fulfilled both these conditions in attempting to determine the accuracy of these tests. Several have not fulfilled either. There are difficulties in the way of doing so. In regard to the first condition, not all the children found in the grades in which they belong according to their chronological ages are normal children. Some sub-normal children are always found in the lower grades at least for which they cannot do the work, but are there for a variety of reasons other than their known intelligence. Furthermore, the first two or three grades contain sub-normal children because it often requires one to three years to discover in this way that a child is really sub-normal. In attempting to fulfill the second condition stated the practical difficulty enters that comes from the fact that in any large number of children there will be but few who are exactly five, six, seven, etc., years old just at the time the tests are to be made. To be

really exact only those children should be chosen whose birthdays come near the beginning of the school year and the tests should be made at that time. If we excluded from these all that did not fulfill the first condition it would probably require several large school systems to get an adequate number of children for the tests.

(b) A second and scientifically better way of determining the accuracy of the tests is to use them on the same normal children on successive years. This has the advantage of excluding the many varying factors that enter in having different children for the different age groups of tests, and would therefore not require such large numbers. The number being small, it would also be more possible to determine through various other sources the exact grade of normal intelligence of the children. It has the disadvantage, first, that might come from the influence of the repetition of the tests on their accuracy, and, second, from the fact that it would take a number of years to complete the study, if the advantages of the method are to be realized in any degree. The method might be feasible in practice in making a final determination of the accuracy of any set of tests after a preliminary try-out has been made in other ways, and by compromising between this method and the former, by taking a small group of children of one chronological age and another group several years older and test them all at the same time for several successive years until the first group has reached the age of the second group at the beginning.

(c) A third way is to use the tests with a limited number of children whose intelligence is accurately known through long and close general observation and school work. The results of the tests may then be compared with the grading of these children on the basis of the other observations. The ages and intelligence of the children is then irrelevant, but we find in this way only whether the relative ranking of the children by the test results into different mental ages is correct or not. We do not learn whether the intelligence of a child with a given mental age as thus determined by the tests is just the same as that of a normal child of the corresponding chronological age. The method has

a rather questionable usefulness because of the unreliability of general observations and estimations of intelligence alone, even when made by the most careful and experienced observers under the best of circumstances.

(d) A fourth way concerns more a method of treating the results of the tests than it does the kind of children tested. It compares, first, the percentage of passes for any individual test in a given age group with that of other tests in the same age group, irrespective of the chronological ages or intelligence of the children tested. In this way we determine which tests in each age group vary from the other tests in the same age group as regards the degree of difficulty the children have in passing them. If in this way some tests are found that are much easier or much more difficult than others in their group, we may next determine what children of different mental ages do with these tests in order to see in what age group these tests fit best. In this way we can get the different tests correctly arranged in a series of increasing difficulty and obtain an accurate scale, which, however, remains arbitrary to the degree in which we do not know whether the tests in any age group are correct for just that age with normal children. In attaining just this end alone this procedure is not concerned with the difficulties found in fulfilling the necessary conditions required in the first method stated above, which aims in addition at getting a definite and complete correlation between the tests of each age group and the corresponding chronological ages of normal children. The chronological ages of the children do not come into consideration. Neither does the question as to whether they are of normal intelligence. We may therefore use the results of the tests with the feeble-minded in this way to determine the relative accuracy of the individual tests, which is the object of the present study. The present results should have an additional advantage through the fact that all the children were tested by the same examiner, thus eliminating the source of error found in the combined results of others because of the lack of uniformity of procedure and of interpretation by the different examiners. Against this, the procedure has an obvious disadvantage. This is that feeble-minded children are not uniform-

ly arrested in all the mental functions. They may be nearly normal in some and relatively poor in others. If, for example, any given function is very much arrested in all or most feeble-minded children, any test particularly involving this function will then appear too difficult as compared with other tests, when as a matter of fact it may be properly placed in the scale for normal children. An attempt was made to avoid errors from this source by eliminating results from certain classes of children. These are (1) the epileptic; (2) those with special sensory defects, chiefly deafness; (3) those with any serious motor disturbance, chiefly paralysis, and choreiform movements; (4) children from whom, from a variety of different causes, the best responses they seemed capable of were not obtained. It is possible that the results are still affected in some measure by this source of error even after these eliminations.

2. Age and Intelligence of the Children Tested. After making these eliminations from about 1,300 children tested there were left 1,006 cases. The chronological ages of these ranged from two to sixty years, and the mental ages, as found by the tests, from less than a year to thirteen years. The following table will give a fair general idea of the nature of the children as regards the distribution over ages and grades.

TABLE I.

Age.	No. Cases.	Av. Age.	Av. Men. Age
1-5	7	4.6	2.6 ..
6-10	85	8.7	3.8
11-15	194	12.9	5.1
16-25	353	20.0	5.5
26+	367	36.5	5.5

3. Relative Difficulty of the Individual Tests. Each individual child was tested with only a part of the scale, the rule laid down for this being that we begin at a point in the scale considerably below that of the mental age we expect the child to have, and stopping considerably beyond the point where he has begun to fail in successive tests. No individual test was therefore given anywhere near 1,006 times. The actual number of trials each test received will be indicated in the following tables.

a. Relative difficulty within each age group. We may find

the relative difficulty of the individual tests by considering first the tests of each age group by themselves and find the percentages in which each test of a given age group is passed by all the children taking the test, irrespective, as was noted above, of their mental or chronological ages. A good measure of the relative difficulty of each test will then be its variation from the average per cent. with which all the tests of an age group are passed. These variations are given in the next table.

TABLE II.

I-II 255						III 395					IV 365					
1	2	3	4	5	6	1	2	3	4	5	1	2	3	4		
+15	+12	+10	+6	-10	-35	+21	-17	-1	-4	0	+11	+17	-16	-11		
V 526						VI 515					VII 469					
1	2	3	4	1	2	3	4	5	6	7	1	2	3	4	5	
+5	-4	+1	-3	+7	-30	+10	+20	-3	-24	+22	+18	-3	+5	-22	-18	
						VIII 403					IX 274					
6	7	8	1	2	3	4	5	6	1	2	3	4	5	6		
+14	+13	-5	-15	-11	+36	-14	+1	+5	+16	+43	-22	-19	-16	-2		
X 172				XI 108					XII 53			XIII 27				
1	2	3	4a	4b	1	2	3	4	5	1	2	3	4	1	2	3
+23	+26	-17	+1	-32	+6	+18	-2	-11	-10	-6	+13	-23	+14	+6	-18	+6

In this table the Roman numerals refer to the age groups of the tests. The Arabic figures in the next horizontal column are the test numbers in each age group, the same numbering being followed as in my account of them referred to above. The figures with the preceding plus and minus signs give the variations in difficulty for each test, a plus sign meaning that that test is easier than the average of that age group, and a minus sign meaning that it is more difficult than the average. The large numbers following the Roman numerals give the number of children that took the tests of that age group. For any given age group this number was the same for every test in that group. The tests of the age groups I and II are those of the 1905 series and are not included in the 1908 series of the authors. Variations of twenty per cent. or over are shown in "black" type. These are the tests, then, that are considerably easier or more difficult than the others in their age group, and will be considered further.

b. Tests misplaced in wrong age groups. A large plus or minus variation is in itself no proof that the test in question is

too easy or too difficult for that age group. Test VI 2, for example, which is much more difficult than others in group VI, might still be too easy for age group VII. Likewise, Test VIII 3 with a variation of plus 36 might be too difficult for age group VII. A way of determining with a fairly close approximation whether this is so or not is to find what children of different mental ages according to the system of tests as a whole do with these tests that are relatively easy or difficult. What per cent., for example, of the children with a mental age of seven who take test VI 2 pass it, as compared with the per cent. with a mental age of six that pass it? What per cent. of the children with a mental age of seven pass test VIII 3, as compared with the per cent. with a mental age of eight that pass it? If for the former less than seventy-five per cent. of the children with a mental age of seven pass VI 2 the test is too difficult even for age group VII. If in the latter seventy-five per cent. or more of the children with a mental age of seven pass VIII 3 this test is too easy for age group VIII. In this way we may find the proper place of each test in the series as regards the degree of difficulty feeble-minded children have in passing it. These percentages are given in the next table for all those tests which in Table II showed a variation of twenty per cent. or more.

TABLE III.

III 1+				VI 2-				VI 4+				VI 6-			
2	3			6	7			5	6			6	7		
N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
129	57	65	98	124	20	114	42	110	53	147	93	135	30	109	50
VI 7+				VII 4-				VIII 3+				IX 2+			
5	6			7	8			7	8			8	9		
N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
118	53	153	86	115	43	73	77	117	88	96	98	68	96	45	98
IX 3-				X 1+				X 2+				X 4b-			
9	10			9	10			9	10			10	11		
N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
42	40	33	61	42	95	35	100	41	90	36	100	34	38	18	72
														7	24
														3	67

In this table the Roman numerals and Arabic figures refer again to the age groups and test numbers. The plus or minus signs immediately following these indicate whether the test appeared as relatively easy or difficult in Table II. The second horizontal column gives the mental ages of the children taking the

tests in question. The third horizontal column gives the total number of children for each test and the percentage that passed it. Thus, for Test III 1 which appeared as relatively easy in Table II, 57 per cent. of 129 children with a mental age of two years who took this test passed it. It is seen from these figures that most of the tests showing a large plus or minus variation in Table II are not misplaced in the age group in which they are found. A few, however, are clearly misplaced. These are as follows: VI 2 and 6 are too difficult for age groups VI and VII, and should probably go into VIII, on the basis of their showing in these figures. VI 6 is too difficult for age groups VI and VII. VII 4 is too difficult for age group VII. VIII 3 is too easy for age group VIII. IX 2 is too easy for age groups IX and probably also for VIII. IX 3 is too difficult for age groups IX and X. X 1 and 2 are too easy for age groups X and probably also for IX. X 4 (b) is too difficult for age group X and possibly also for XI. In these conclusions it must be noted that the exact place for a test is not always determined with certainty. VI 2, for example, is too difficult for group VII, but it may be too difficult for group VIII even. VIII 3 is too easy for group VIII, but it may be too easy for group VII also. In such instances as these we can infer the proper place of the test with approximate certainty from the size of the percentages. The required figures here are lacking because too frequently there would be no occasion to give a child with a mental age of eight the test of age group VI, or to give a child with a mental age of six the tests of age group VIII.

4. Some General Observations on Individual Tests. In several instances minor changes in the procedure in giving a test were made after the prescribed way had been tried out for some time. They probably had some effect on the difficulty of the tests and will be noted here. In IX 3 the procedure was changed to the following. The child was asked: "If you went to a store and bought a pencil for nine cents and gave the clerk a quarter, how much money would you get back?" No time limit was made use of. The answer had to be determined mentally, but if a wrong reply indicated some minor slip in the process, such as six, or fifteen, instead of an entire inability to figure it out, the child

was given a second trial. This change was made because it seemed that "playing store" was too childish an operation for children with a mental age of nine. It often spoiled the attitude of the child for following tests. For the same reason other words were substituted for those to be defined in IX 4. A child with a mental age of nine is too intelligent to be asked, "What is a fork? a chair?" etc. The words used were foot-ball, balloon, telephone, tiger, and battleship. In IX 6 it was found that the child would often not pay attention to so much direction at a time as to what to do, and would then fail in the test because he did not understand all he was to do. The authors also note this fact but seem to include this understanding of the directions as a part of the test. For feeble-minded children this seems to make this test too difficult. The procedure used for about the latter half of the cases examined was as follows: "Here are some weights. They do not all weigh the same. Some are heavy and some are light, and there are no two just alike. Lift them all like this (illustrating by lifting several successively with thumb and forefinger) and pick out the very heaviest one that is there." Then, "Now put it down here and pick out the next heaviest one and put it with this." Then, "Now pick out the next heaviest one and then the next and so on, putting them all in a row with these other two." If in the second and third trials these directions were not followed as much of them was repeated as was necessary to reduce the whole mental operation to that of merely discriminating the differences in the weights and arranging them in order. XI 1 (e) was omitted because the children often gave interpretations that did away with the nonsense of the sentence. The child was then allowed one failure in the remaining four. In XI 5 the correct sentence was given the child if he failed in the first, as a further means of showing him just what he was to do. He was also allowed two to three minutes for each of the remaining two instead of only one minute, if he showed any persistent and intelligent effort to get the sentence. This change made this test considerably easier, but was a change in the right direction as is seen in the above tables. XII 3 was regarded as passed when the first sentence with only twenty-four in-

stead of twenty-six syllables was repeated without error. In addition to this it may be noted that VI 6, "giving age," is a poor test for feeble-minded children of institutions, although it may be a good test for normals. Normal children could not know their age without being told and would not keep track of it without more or less frequent occasion to think about it. Feeble-minded children living in institutions do not get these occasions, are not asked to tell their age by parents or others, and quickly lose track of it.

5. Comparison with Results of Others. The above tables show nine tests to be misplaced in the series from age groups III to XI, inclusive. In the case of six of these the results of others who have tested large numbers of normal children agree substantially. The disagreements are as follows: Goddard's figures show VI 6 as correctly placed, while Terman and Child's show it as too easy. The reason for it being specially difficult for the feeble-minded was just given above. For Goddard, Terman and Childs VII 4 is correctly placed; for Johnston, Binet and Simon (1911 series) it is too easy and for Bobertag it is too difficult. According to our figures it should go into age group VIII. X 2, appearing as too easy in our figures, agrees only with Binet and Simon's 1911 revision, and disagrees with three other authors, two of whom have it as correct, and the third as too difficult. On the whole, our figures with the feeble-minded children do not indicate as many misplacements of individual tests as do the previous results of others with normal children. They agree fairly well with Goddard's figures as regards the general accuracy of the scale, and do not verify most of the larger changes indicated by the results of Terman and Childs. But, as is the case with previous results, the present figures are not adequate to show anything conclusive in regard to the upper part of the scale, because the number of cases tested with these higher age group tests is again too small, while, on the other hand, they give a better indication of the status of the tests in the lower age groups.

B. The Influence of Age and Training.

See Table IV, in "The Present Status of the Binet-Simon Tests," this Journal, 1912, P 131.

We can only in a very general way determine off-hand whether the results with a certain test of intelligence are influenced in any serious degree by variation from the usual in the training of the particular child tested. This has become very obvious from the lack of agreement on this point among writers on the Binet-Simon tests. At the same time no statistical results are yet at hand that can throw any light on this question. When normal children are tested we usually know nothing of any special training or information any child may have that might affect the results of a test. In examining feeble-minded children this question becomes much more important. For the much larger chronological ages of the feeble-minded as compared with normal children of the same intelligence has given the former much more time and opportunity to acquire various kinds of information and skill. As Binet and Simon themselves note, the older feeble-minded person can do many more things than can the normal child of the same intelligence. But this very condition enables us to get some evidence on this question from the results of examining feeble-minded children. For if in any age group of tests any individual test is affected by training in this way the older feeble-minded person should pass this test relatively more easily than he does the other tests in that group which are not affected by training. We may arrange the results of the different tests under different chronological age groups to see whether this is the case. This is done in the next table.

TABLE IV.

Age	III					IV				V				VI	
	1	2	3	4	5	1	2	3	4	1	2	3	4	1	2
6-10	+15	-13	+3	+7	-11	+10	+19	-25	-4	+9	-10	+7	-6	+4	-30
11-15	+27	-12	0	-1	+4	+19	+12	-19	-14	+11	-5	+2	-8	+7	-31
16-25	+21	-15	-3	-6	+2	+10	+19	-17	-11	-3	0	+7	-2	+6	-34
16+	+22	-18	0	-6	+1	+8	+17	-3	-3	+4	-3	-3	0	+8	-27

Age	VI							VII								VIII	
	3	4	5	6	7	1	2	3	4	5	6	7	8	1	2		
6-10	+6	+13	+3	-15	+18	+40	+2	0	-33	-25	+18	+19	-25				
11-15	+10	+16	0	-19	+19	+20	-2	+11	-19	-27	+10	+12	-2	-24	-7		
16-25	+10	+19	-3	-19	+19	+18	-2	+5	-19	-19	+11	+10	-5	-20	-12		
26+	+12	+30	-3	-19	+19	+8	-5	-2	-26	-10	+19	+16	-4	-6	-16		

Age	VII				IX						X				
	3	4	5	6	1	2	3	4	5	6	1	2	3	4a	4b
6-10															
11-15	+43	-14	-3	+3	+10	+37	-22	-16	-13	+11	+19	+28	-2	-3	-43
16-25	+36	-14	+3	+4	+17	+45	-19	-20	-21	-1	+13	+19	-25	+17	-23
26+	+26	-15	+3	+5	+18	+45	-24	-19	-11	-9	+29	+25	-24	+4	-32

The chronological ages, arranged in five and ten year groups, are given in the vertical column on the left. The figures with the preceding plus and minus signs are obtained in the same way as those in Table II. A plus sign means again that the test in question is easier than the average in that age group, and a minus sign means the opposite. Evidence of influence of training on any test is then given when the figures with the plus signs increase from one chronological age group to the next higher, or when the figures with the minus signs decrease in this way. In order that the conclusion from these figures may be valid the assumption must be true that no test becomes more difficult with increasing chronological age. For if this were the case for any one or two tests in a given group the method of figuring would necessarily make the other tests in this age group appear as becoming easier with increasing chronological age. But there hardly seems any possibility of this assumption not being true. What now do the figures of this table indicate? For those tests for which any tendency towards an influence of training is shown at all the figures are given in "black" type. These tests call for the following tasks: III 1, showing eyes, nose and mouth. III 5, giving full name. IV 3, repeating three numerals. V 2, copying a square. V 4, counting four pennies. VI 4, defining words according to use. VII 5, repeating five numerals. VII 8, naming four common pieces of money. VIII 1, reading a given passage. IX 2, naming the days of the week. X 1, naming the months of the year. Figures for the higher age groups are not given because the number of children tested for the different chronological ages was too small, below thirty for a test and each chronological age group. Of these tests III 1, 5, V 4, VII 8, IX 2, X 1 concern the formation of the simplest kinds of associations, and we would expect this kind of test to be influenced by age and training if any are. VIII 1 has already been dropped from the series by the authors because of influence of training. IV 3, and VII 5 are concerned chiefly with memory, a mental function which in itself seems not to be particularly arrested in feeble-mindedness, and which therefore goes on improving in an approximately normal way with increasing age, though it is not much affected by training. VI 4 concerns very largely the develop-

ment of language, and language is one thing above all others in which all children receive persistent training. This leaves only V 2, copying a square, to be accounted for. That is, the figures in this table agree with what we know about the nature of the mental processes involved in the tasks of the tests that the figures indicate as affected by age and training. But no great stress is to be put on this sort of analysis and explanation, for if we proceeded in the same manner with other tests we would find a number which ought to be influenced by age and training for which the figures in the table do not show any such influence. Besides, it is seen that the apparent influence of age and training is very small in some of the cases mentioned, and may be due to merely accidental variations in the figures, that is, to minor, unknown causes. The important conclusion that remains is that age and training have not affected enough tests seriously enough to cause any great errors in the mental ages from this source. The increasing ability of the children to pass certain tests with increasing chronological age is not very marked. Data in the previous tables showed that any test must have a plus or minus variation of at least 20 before it was found to be too easy or too difficult for its age group. For a test to become too easy for an age group through the influence of age and training it should show an increase of at least 20 in the plus variation or a decrease of 20 in the minus variation with increasing age. This is true only of IV 3, VI 4, and VII 8.

C. Value of the Scale in Grading Feeble-Minded Children.

I. As an Arbitrary Scale. Aside from the question whether the mental ages obtained with the tests are always exactly correct, the scale could still have a great value if by means of it we got an accurate arbitrary ranking of the children tested. In this case the scale would give ten arbitrary grades represented by the mental ages of three to twelve years, inclusive. It would not seriously detract from its merits if these grades did not represent equal steps of increase in general intelligence, but varied from this equality in unknown ways. As a matter of fact, we know that if the mental ages obtained were absolutely correct in all cases they would not represent equal steps of progress in mental development. They would give steps decreasing irregularly in

size from three to twelve years because the normal rate of mental development from year to year varies in this way. And we are far from knowing just how the course of this rate runs with normal children when we deal with its quantitative aspect. It is further, therefore, entirely possible that the tests are too difficult in the upper part of the scale and too easy in the lower part, as has been held, while yet the mental ages obtained with them may represent correctly successive steps in mental development. If this is the case, the question then becomes not whether a child for whom the tests give a mental age of five, for example, is of exactly the intelligence of a normal child of five years chronologically, but whether the child with a mental age of five is always brighter than one with a mental age of four, and never as bright as one with a mental age of six, according to the tests. We are then concerned with the question of the range of variability from correct results, not with the question of any constant error in a given direction. In the writer's opinion this range of variability from correct results depends more on the examiner than it does on any inherent characteristics of the tests themselves. Under the same conditions the tests give the same results. It is the function of the examiner to keep these conditions the same, or to make the proper allowances where he cannot control them. This means that he should understand the tests and children, that he should give the tests always in the same way and know how to adapt details to particular circumstances met with the individual child; that he should interpret results always in the same way and be able to recognize special conditions which call for different interpretations of results. A trained examiner thoroughly familiar with the use of the tests should not make very frequent serious errors in the mental ages obtained.

2. As Compared with the Usual Method of Grading. In judging the value of the tests in grading feeble-minded children, however, we cannot base our conclusions entirely on the degree of accuracy of the tests alone, but must compare them with other means at hand. How much more accurate and useful are the tests than anything else we have? In institutions the usual procedure has been to grade the children from general observations by those best qualified to make those observations. We have

always known that frequent errors are made in this way because two different observers will rarely agree on the grading of any group of children in question. But the magnitude of such errors has never been determined. The writer obtained some results which throw some light on this question, though his object at the time concerned another matter. A list of one hundred and fifty children with mental ages of eight to twelve inclusive was made out, and from this list each of the teachers of the school was asked to make out a new list of all those children whom she thought she knew well enough to grade accurately. They were asked to classify them into the grades A, B, and C, with two doubtful grades, one between A and B, and the other between B and C, thus making five grades. Each teacher was to exclude all cases from her list to be graded which she could not definitely place in one of these five grades. Further detailed instructions were given and discussed, the main points in which were that all the children on the list were mentally eight to twelve years, but that they should base their classifications on their own observations alone chiefly, and, if the observations of attendants or others were taken into account, that care should be taken to distinguish between expressed opinion as to grade and observed facts as to what a child could do. Emphasis was put on the request for each teacher to do the grading independently of the opinion of others or knowledge of the mental ages if these happened to be known. Over two months were used in which to do the grading during which time preliminary classifications were to be verified and special observations made on those children whose grades remained at all in doubt. The reasons for this procedure cannot be discussed here further than to state that it was a plan intended to eliminate as many as possible of the various sources of error met in grading children in this way. From the total results obtained all those children were then picked out who had been graded by at least three different teachers. The grading of these children is given in the following table:

The first horizontal column gives the cases, from 1 to 50. The chronological ages are given next, then the mental ages under "M. A." and next the average grades of the teachers under "T. A." In the last the A, A-B, B, B-C, and C grades of the

TABLE V.

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Age	19	33	18	14	14	17	21	14	18	16	23	15	17	29	12	26	15	15	11	20	25	15	12	18	24
M. A.	8	9	11	9	8	8	8	9	10	10	8	9	10	9	8	9	10	10	8	11	11	9	9	11	8
T. A.	9.8	11	10.4	9.8	8.4	8.2	8.0	10.3	11.3	10.8	9.0	9.6	10.6	12	10.8	10.5	11.0	11.1	11.0	12.0	11.7	10.2	9.3	11.0	10.0
R.	3	4	3	4	2	1	0	1	4	2	3	3	2	0	2	2	3	2	2	0	2	2	3	2	3
A-12		3	1	1					5	1			1	5	2	1	3	3	3	4	5			3	
A-B-11	2	1	1	1				2	1	2	1	1	1		1			2	1			2	1	2	
B-10	2		2	1	1			4		2		2	3		3	3	1	2	3		1	2	1	3	1
B-C-9	1		1	2	1	1					2	1					1					1			
C-8	1	1		1	5	3	5		1		2	1										2		1	
No.	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Age	27	32	14	20	17	11	11	28	30	26	14	18	33	34	19	13	32	16	20	28	11	17	26	15	20
M. A.	11	8	11	10	8	10	11	8	13	10	10	8	9	12	8	8	9	10	9	12	8	9	12	11	11
T. A.	12.0	11.3	11.8	11.7	10.3	11.8	11.9	9.0	12	9.4	11.2	9.4	12.0	11.4	10.0	8.5	11.8	9.4	10.6	10.0	9.6	10.2	11.8	12.0	11.6
R.	0	2	1	2	4	1	1	2	0	4	2	3	0	2	4	2	1	4	2	4	3	4	2	0	2
A-12	6	2	4	5	1	3	6		4	1	3		4	5	1		3	2	1	1	1	1	7	4	4
A-B-11	1	1		1	2	1	1					1			2	1	1	1	3	1	2	1	1		1
B-10								2		1	2	2		2	2	1									
B-C-9										1								2		2	1				
C-8					1			2		2		2			1	3		3		1	1	1			

teachers were reduced to terms of mental ages again, giving the A grade a mental age of twelve, the A-B grade the mental age of eleven, the B grade the mental age of ten, etc., thus covering the range of mental ages from eight to twelve, inclusive. The figures under "T. A." give the averages of these mental ages. Under "R" is given the range of the teachers' grades, expressing the difference between the lowest and the highest grade for each child. The other figures give the number of teachers who graded each child according to the five grades indicated. Thus child No. 1 was given the A-B grade by two teachers, the B grade by two, etc. The most striking fact about this table is the frequent wide range of disagreement of the teachers' gradings. For nine children these grades differ by four years, for nine others they differ by three years, for nineteen by two years, for six by one year, and for seven there is complete agreement. There can be no question about the fact that the Binet-Simon tests do not make half as frequent or as great errors in the mental ages as are included in these gradings based on careful, prolonged general observation by experienced observers on this class of children. In other words, the chances for errors with the tests are much less, and are smaller when they do occur than is the case with the grading of any one individual experienced observer when this grading is based on the usual general observation. The several criticisms of the tests do not ascribe this degree of error to them, even not for the upper part of the scale, where by common consent it appears the poorest. There is a much closer agreement between the mental ages as given by the tests and the averages as given by the teachers than there is between the gradings of the individual teachers. In the former this agreement would be still closer, except for the fact that fractions of a year in the mental ages as given by the tests were always dropped, making these in most cases a fraction of a year too small. In forty of the fifty cases in this table the teachers' average grading is above the mental age as given by the tests. Considering this, it is seen that there is a fair agreement between the test gradings and the teachers' average gradings.

Besides being more accurate than other available methods, the Binet-Simon tests gain their value and practical usefulness

through the fact that it requires only about an hour to examine a child with the tests in place of weeks or months of general observation to get similar results. The economy of time on the part of the examiner may not be counted, but the importance for the children of being promptly and correctly graded so that they may be placed at once where the institution can serve them best will hardly be disputed.

3. Needed Additions to the Scale. The authors devised the scale of tests mostly to meet the requirements of examining public school children, and for this purpose the tests are well adapted. But the schools for the feeble-minded and other institutions have need of a means of diagnosing mental deficiency in children before they enter school, and also in the older children and adults after they have left school. There is a general feeling, based on certain well known facts that very much more could be done in many cases of feeble-mindedness if the deficiency could be recognized at or soon after birth. How far this is really true can never be determined until we have a more accurate means of diagnosing deficiency at an early age. With such means at hand a new field of endeavor would be opened. In any case, the schools for feeble-minded are constantly called upon to pass on the mentality of children before they reach the age of three, the point at which the present scale of tests begins. Observations on the development of the child during the first three years have been slowly accumulating, and it seems quite possible that tests could be devised that would enable us to extend the scale downward to birth and in smaller steps than whole years of mental growth.

The need of additions to the upper end of the scale is at present more imperative than the former. The tests are not entirely adequate for determining small differences in intelligence of older children or adults near the borderline of the normal. It is just at this point that there is a special call for making small distinctions with accuracy and certainty. The difference between the just slightly feeble-minded and the lowest intelligence that we call normal may not be significant from the scientific standpoint of psychology. But from the standpoint of the disposal society is to make of the individual it becomes all important, for society no less than for the individual. We have at present

nothing that meets this demand. Opinions of experts based on general observations is usually worthless at this point, a fact proven conclusively enough by the constant disagreement of such experts. A method from which the personal factor of the observer is mostly eliminated, such as mental tests alone can give, is required.

D. Summary.

1. Nine of the individual tests are too easy or too difficult for the age group in which they are placed. Some of these need to be shifted by more than a year up or down the scale.

2. Minor changes in the procedure in giving a test are required in several instances.

3. The present results with the feeble-minded agree quite well with previous results with normal children as regards the degree of general accuracy of the scale. They do not verify the larger and more frequent errors obtained with the tests by some authors. The test results are much more accurate on the whole than are the gradings of the feeble-minded by experienced observers without the use of tests.

4. Some influence of chronological age and training detracting from their value as tests of intelligence is present in a number of instances. But in only three tests is this influence found to be great enough to make the test in question too easy for the age group in which it is placed.

5. There is much demand for additional tests that would extend both the lower and upper ends of the scale, the former to make the earliest possible diagnosis of mental deficiency in infancy, the latter to determine with accuracy and certainty small differences in intelligence of older children and adults at the borderline of normal intelligence.

DISCUSSION

Dr. Goddard: I am deeply interested in this paper of Dr. Kuhlmann's and in the results which he has found. This splendid arrangement of his results is certainly a contribution and I am very much pleased to be able to confirm his findings almost entirely. (Dr. Goddard then placed his charts showing drawings

by children tested, further illustrating the wonderful results obtained through these tests.)

Dr. Lange: I shall try to be very brief in my discussion. I would like to say a little more about the charts Dr. Kuhlmann put up for us. I have very few cases who have not been able to name the four colors. I think that test is not even a seven-year-old test but a five-year-old test. I think if we take a general view of the Binet test it is a very splendid test to determine the relative standing of a group of children. As a diagnostic means to decide whether a child is feeble-minded or not, I do not think it is of any value whatever. We have in the Glenwood institution twenty-two children of whom three tested one year ahead of their age; six tested just exactly their right age; five, one year later than their real age, and eight two years later. The three children are normal. Of all the others, especially of the six testing their real age, there is not the slightest doubt about their being feeble-minded. If we can depend upon the Binet test absolutely, these children would not have been sent to our institution at all. Yet there is no doubt that these children are feeble-minded and their proper place is in the institution. The same is the case with those who are one year retarded and those who are two years retarded. I have found that very few feeble-minded children can tell the names of the days of the week. But go to the custodial group and ask them the same question and there is hardly one in this class who cannot answer the question accurately. This certainly is training. In the test of "How old are you?" I found a queer thing—a child gives the age he was when he came to the institution. No one is interested in his age after coming to the institution and he never hears it mentioned. At home it was different and so he remembers and tells his age as it was when he came from home. This also is a matter of training. It seems to me that we must be very careful what we are doing with these tests and what we think we can do with them. It has been suggested that the officers of the juvenile courts should be able to use these tests. I answer in this way. It is absolutely necessary for an experienced person to make the Binet test.

Dr. Goddard: May I have just a word expressing my very

emphatic disagreement with Dr. Lange in that last statement. I do this because I think the future of the movement of using these tests depends upon this question. I think the fact that we have data showing that children tested five times by five different people and passing the same way, absolutely refutes that. I believe that the Binet tests are useful and that any person by temperament at all fitted to be near children can use them with accuracy. I believe that if a child is more than three years backward he is absolutely feeble-minded. It will be a dreadful calamity if these tests are confined to institutions; it will also be dreadful if we confine them to psychology.

Dr. Lange: I do not want you to have the impression that I do not believe the Binet test a good thing. I believe in the tests and think that they are the best we have at present, but I do think they should be changed to suit the locality in which the test is made and that some of the tests are entirely too easy and others too hard, for the ages given.

Dr. Murdoch: It seems to me that Dr. Lange's experiments are a wonderful contribution to the Binet test. I think that this is a very trivial matter in the general question of the test to a few borderline cases. I think the whole subject is wonderful.

Professor Johnstone: In reference to the question of preliminary examination. Every institution feels the need of this and is deluged with letters making inquiries along this line. Several times attempts have been made to start something of the kind. It seems to me that this association, as an association, should select some five, ten or fifty points that they want to know about and each institution take at least one of them and find out facts. Then we could have them tabulated some way and get some accurate idea. I believe that there should be a committee appointed at this meeting to determine what are to be the ten most important things necessary for us to take up.

WORK AMONG MENTALLY DEFICIENT CHILDREN IN GRAND RAPIDS, MICHIGAN

BY MARY ELIZABETH JUDSON

The work among backward and mentally deficient children as established in Grand Rapids, Michigan, has grown out of the superintendent's observation of such children as he had noticed them in the various grades. A still further interest was aroused in the public mind by lectures given by several of the country's prominent men in this work.

Like all other new movements, it has had its ups and downs. The first appropriation of three thousand six hundred dollars in the spring of 1910, was put in the budget, then thrown out, only on further consideration to be allowed. In the spring of 1910, our superintendent of schools sent to the different buildings a bulletin asking for the names, ages, addresses and grades of children that were very backward. This list when sent in contained ninety-two names. At that time a child might be known as very backward but not generally recognized as mentally deficient. The list was given to one of the fourth grade teachers who had observed for some time the growing need of help for the mentally deficient child. Forty home calls were made by this teacher and a class of twelve was formed as part of the summer vacation schools. In one of the ward schools, where there were no other pupils, a room was opened for the summer to begin the work among this class of children. The children all lived within walking distance as the means of transportation had not then been decided by the board of education.

In making home visits, it was found that some parents deplored the lack of their children being able to read, write and spell. While clay work, basketry, games, music and drawing had a prominent part in the summer's program, more attention was given to the literary work than is generally done in vacation schools. This summer class formed the nucleus of the school when the special work was made part of the public school system.

A fifth grade teacher, who had taken the summer course at Vineland, was put in charge and in the course of three or four months the school had four classes with an average of twelve members each. The teacher of the summer class took charge of the academic departments and with a kindergartner the faculty numbered three until about the middle of the year. In looking for a permanent place to establish a school for mentally deficient children, it was decided to use a small school building of two rooms that had been vacant for two years. These two rooms were sufficiently large to make four medium sized rooms. The two on the lower floor are used, one for the kindergarten room, and one for the domestic science room. The upper rooms are devoted, one to the academic work and the other to bench work for the high grade boys, sewing and basketry for the high grade girls and construction work for the boys and girls of the middle grade class. The kindergarten is also used for such physical culture work as there is room to give.

The work in physical culture classes on Mondays is in charge of the academic teacher and on Tuesdays and Wednesdays, of the domestic science and manual training teachers—the domestic science teacher presiding at the piano and the manual training teacher directing the exercises.

A generous board of education gave the school a fine equipment in all its departments and the problem of transportation for pupils was solved by the street car fares being paid out of the appropriation for this school. Our pupils come from all parts of the city, many of them having to change cars. In some cases, the smaller or more deficient children are taken care of by older and more responsible pupils that may live in the same neighborhood. Our kindergarten presents the most pronounced, and to the untrained teacher, the most easily recognized types. In this class are found the various grades from the low grade imbecile to the low grade moron. The average physical age of this group of fourteen children is 11.2 years, while the mental age by the Binet tests is 5.1 years. The members of the middle grade class are nine boys and four girls, whose average physical age is 11.5 years. The average mental age as found by the Binet tests is 6.3 years. Our high grade girls, twelve in number, are

in a class by themselves. Their average physical age is 14.4 years. The average mental age by Binet tests is 9.5. The class of high grade boys, fourteen in number, have an average physical age of 12.5 years while the average age by the Binet tests is 9 years.

At this departmental center, since the beginning in September, 1910, seventy children have been enrolled. At the present time, we have an enrollment of fifty-two. Some of the children, as they have reached the age of sixteen have left school to work in the factories of the city. Three boys have been promoted to ungraded rooms. Several have moved to other cities. A note written recently by one of the mothers says: "He wanted me to write you a line to tell you what he made every week. He makes from \$1.50 to \$2.00." This boy is very seldom absent from school. At the end of the afternoon session, he hurries home and works in a factory where trucks are made.

In one of the school buildings of the West Side is another center in charge of one teacher. This center was established in October, 1910, and placed in charge of an experienced first grade teacher. This teacher paid some attention to reading, writing of sentences correlated from hand and manual work. Very little book work was given but some work in phonics and telling and re-telling of folk-lore. Physical culture work was given in the roomy hall on the first floor. Our West Side center has cared for twenty-four children in all with an average enrollment of twelve. The present school year, this center is in charge of a Vineland graduate. At the departmental center, there are three Vineland graduates, an experienced kindergartner and one teacher who has been trained in some of the leading institutions of the United States.

What are we accomplishing with these children? Sometimes, after a day's work, it does not seem as though we had made much headway. Yet, when we look at our children that have been with us since the fall of 1910 and realize what quarrelsome, unhappy and uncontrolled children they were then, and now in many faces see a brighter and happier look, we know that little by little the segregation of these children and the freedom from the stress and competition of the regular school

room is telling. Many of the children had been in one grade for two or three years, were wretched, unhappy, quarrelsome with their companions as well as a problem of discipline for the teacher. Within a month, one of the teachers, in talking to one of our boys, asked him if he liked to come to our school. He smiled and said he did and that he never had such a good time in any other school. This lad whose chronological age is fifteen and mental age six, a year ago was an unruly and quarrelsome child and could not play with his companions long at a time without trouble. Of late, he has gladly shared his sled, toys, and even his lunch with his classmates.

The specialists of Grand Rapids have helped greatly by the attention they have given the children. Teeth have been cared for, eyes fitted to glasses, adenoids and tonsils removed. One of the visiting nurses makes a weekly visit to carefully look over the children and a word of praise from her for cleanliness is something a great many of the children try to deserve each time.

In deciding on a name, the superintendent wanted one that had no stigma connected with it. The departmental building is called "The Auxiliary School for Exceptional Children." In this connection a rather amusing incident happened one afternoon during the late winter. A visitor from out of the city reached the school house sometime after school had been dismissed only to find the building locked. The visitor inquired of a small boy who was passing if that was the Auxiliary School. The boy said that he did not know but "That is where the children are not as well educated as they are in other buildings."

SOME EYE, EAR AND THROAT CONDITIONS COMMON TO THE FEEBLE-MINDED

BY B. A. BLACK, M. D., *Polk, Pennsylvania.*

There are but few if any conditions of the eye which are alone peculiar to the feeble-minded and may not be found in the normal individual; but when we note the development of the eye as being from the anterior cerebral vesicle, and the retina really a prolongation of the brain substance, it is reasonable to suppose that ocular defects are of more frequent occurrence among the feeble-minded than among normal people. Gilbert, however, observes that the eye may frequently escape the influence of morbid causes which affect the brain because it is fully formed at an earlier period of foetal life. Blindness, from birth or early infancy, may occur along with mental defect; or when it occurs in conjunction with defect of some of the other senses, the mind may be so impoverished as to bring about a condition of true mental defect—the “amentia of deprivation.” The growing brain cells must be stimulated by vibrations transmitted through the special sense pathways. This is shown by the poor development of the occipital cortex that occurs in congenital blindness which fact has been utilized in mapping out the visual area in the brain. But not only are the sensations thus necessary for growth, they are also the material out of which thoughts and ideas are built, and the sum total of which constitutes mind. Should, therefore, a single sensory avenue be blocked, the mind must forever remain the poorer by the impressions which would have entered through this channel.

Juvenile cataract is not of infrequent occurrence. It consists of an opacity of the lens substance, its capsule, or both, varying in degree from that in which the opaque zone can barely be detected, to a density through which no red reflex from the fundus can be seen. It is generally attributed to interference with the nutrition of the lens at an early period of life. Heredity, also, seems to be a potent factor in its development. Derby reports eight cases in members of one family, and in this insti-

tution there are three members of one family—brothers; two of another, a brother and sister, also similarly afflicted. Errors of refraction occur in a large percentage of cases, hyperopia being the most common deviation. Of two hundred cases examined here, eighty per cent. were found to be hyperopic. Myopia is of less frequent occurrence, being found in nine per cent. of the cases. Astigmatism is also frequently met with. The range of variation was from one half to ten dioptries. The cases selected were ones in which visual defects were known or supposed to exist, consequently, the percentage is higher than would be found were the cases taken in order.

These cases are of special interest on account of the improvement noted in many of them after being properly corrected, although all cases are not amenable to correction. Glasses among the low grades, of course, are impractical for obvious reasons. However, in a number of apparent low grades the proper fitting of glasses, enabling the child to see, has practically promoted him to a higher grade. In all grades the improvement in vision must be marked, or the relief of eye strain quite appreciable, or they do not care to wear the glasses after the novelty of them is over. But in those cases which are indicated, such improvement will be noted in the child's application and progress as, compared with his previous record, leaves unquestionable the value of this means of helping the child. The common means of testing vision by means of Snellen's test charts is of limited use, being applicable only to those cases who can read. The shadow test by means of the retinoscope is the most practical and can be used in all cases where the cornea and media are clear. It is accurate and obviates the necessity of relying upon the statements of a child. The average eye, however, especially in hyperopia, will not stand full correction, but if the child can read, the test types will be a valuable aid in determining the amount of deduction to be made.

Among the motor disorders we find nystagmus and strabismus, the latter being quite common. In a great many of these eyes central vision is very poor and the field of vision restricted. This amblyopia has been regarded by some as a condition antedating the squint, and, in fact, causing it; by others, to the pro-

longed disuse of the squinting eye. Which view is correct is still undecided although the latter seems more probable. However, the fact that in young children the proper fitting of glasses and affording normal vision, the squinting eye can be trained to fix with its fellow and the squint permanently overcome, gives some weight to the former theory.

Amblyopia is also quite common in cases of imperfect refraction which prevents the formation of perfect images on the retina, in consequence of which the proper stimulus for the development of normal vision has always been wanting. The proper correction offers very little if any immediate improvement, but if the child can be prevailed upon to wear the glasses for some time the vision will gradually improve. Sometimes we find vision quite subnormal when there is no error of refraction and on examination of the fundus no pathological condition can be found. This can only be attributed to a dullness of the visual sense.

Congenital word-blindness is a developmental defect of the visual memory center for the graphic symbols of language in the cortex of the brain and is not a true ocular defect. According to Thomas, it occurs once in about two thousand normal children and as often as once in twenty mental defectives. It manifests itself in the inability of the child to learn to read and the most painstaking efforts to teach him are an absolute failure. In other ways he may be reasonably bright with fairly good powers of observation and reasoning. He may be able to learn by word of mouth instruction and is often clever at hand work and drawing.

Among the anomalies of the appendages of the eye, probably the one most frequently seen is epicanthus—a ridge of skin from the upper eyelid around the inner canthus which seems to be due to an unusual redundancy of the skin in this region. It may be unilateral but it usually affects both eyes. It is aggravated by depression of the bridge of the nose but is not caused by it. These folds can be obliterated by pinching up the skin over the bridge of the nose but they immediately return when the skin is released. In the Mongolian, we find the palpebral fissures small

and obliquely placed so that the inner is lower than the outer end.

Abnormalities of the external ear are well known to occur among normal people but are of much more frequent occurrence among mental defectives and when they occur along with other stigmata of degeneracy, are of diagnostic value. Defects of the lobule are most commonly met with. Often it is unusually large and fleshy, and sometimes very small or even absent. Frequently it is found adherent to the face. The pinna may be small, thin and circular, resembling the chimpanzee, or the whole ear may be excessively large and outstanding with a marked convexity as seen from behind. Numerous minor malformations of the helix, antihelix, tragus and antitragus are also found. Occasionally we find the auditory apparatus so imperfectly developed that total deafness is the result. This, however, aside from those cases which in conjunction with defect of some of the other senses result in the "amentia due to deprivation," is rare. Among low grades and idiots, what is often mistaken for deafness is simply lack of attention. They give no heed when spoken to, or to noises of many kinds but when we try them with some sound in which they are interested, as the rattle of the plate and spoon, or possibly the sound of a musical instrument, we get some response. Among the higher grades, hearing, as a rule, is not so acute, nor are the fine differences of tones so well detected as by the average normal person. Deafness, when it does occur, is usually the result of disease. Eustachian catarrh, the suppurative and the non-suppurative diseases of the middle ear all cause impairment of hearing to a greater or less degree, but absolute deafness only occurs in labyrinthine disease, or disorders of the auditory nerve.

Hypertrophic lymphatic tissue in the vault of the pharynx is a very frequent and a very noticeable disturbance. This tissue is normally present surrounding the crypts in the mucous membrane of the pharynx and in the pharyngeal tonsil and it is only in its overgrowth that it becomes pathological. The direct consequence of this condition is obstruction of nasal breathing to an extent proportionate to the space occupied by the new growth—the size of which may fluctuate on account of the vascularity

of the lymphoid tissue—a moderate enlargement being unnoticed during the erect posture but the increased blood supply during the reclining posture may entirely prevent nasal breathing. Consequently, the child sleeps with his mouth open and snores when lying on his back. Excessive secretion is often present, and, being unable to blow the nose, the purulent matter is drawn back into the pharynx. In marked cases, during the developmental period of the accessory sinuses of the nose, the columns of air which normally pass in and out and aid materially in the expansion of these sinuses, are absent resulting in their imperfect formation. The bony palate becomes more acutely arched and the dental arch of the upper jaw may become almost V shaped and the lateral teeth may point inward instead of straight downward. The voice has a peculiar, dead quality or lack of resonance due to the interference of the growth with the excursions of the sound waves transmitted upward from the larynx, and impairment of the “sounding board” function of the pharynx. These children take cold easily and cough, especially during the inclement season, is quite common and is due to the irritation of loosened secretion, to persistent bronchial inflammation, or to reflex disturbance without lesion in the lower respiratory passages.

The condition is largely an affection of childhood but sometimes lasts longer. As a rule, the pharyngeal space grows faster during the second decade of life than the adenoid tissue which often undergoes partial involution. Hence, after adolescence the mechanical interference with breathing subsides somewhat. The characteristic vacant, apathetic and staring expression is accentuated, in later cases, by projection of the upper lip and jaw, contraction of the nostrils and a vascular fullness of the lower eyelid whereby the lid space is reduced in aperture. This condition in itself is not recognized as a cause of feeble-mindedness but it undoubtedly aggravates it, probably through a sluggish lymph circulation at the base of the brain which, in turn, affects the functional activity of the higher centers. Retzius and Axel-Key have demonstrated the close anatomical relations between the lymph channels of the naso-pharynx and those of the base of the brain. In pronounced cases, however, there is no

other one thing which will do more toward the child's improvement, both mental and physical, than the removal of this hypertrophied lymphoid tissue. The child, with his arrested mental development requiring the most painstaking efforts to awaken his dormant faculties to any degree, is problem enough in itself without allowing his condition to be aggravated by such physical conditions as will hinder normal mental activity in any child.

DISCUSSION

Dr. Murdoch: I consider this a very valuable paper and I wish in connection with it to speak of the valuable work which Dr. Black has done among our children in attention to the details of eye and throat conditions. It is wonderful how much more children get out of their school work if their ocular trouble is corrected, and the improvement in their general condition through the removal of adenoids is also very gratifying.

Dr. Rogers: What is being done in a dental way in your institution?

Dr. Murdoch: We have no resident dentist but have a dentist from Franklin come here to spend one day of each week, and more if necessary. To him are referred acute cases requiring immediate attention and children on admission are examined. Before adopting this plan we spent a long time in systematically going over the institution and examining the children, taking up a cottage at a time. Now the physicians refer to the dentist such cases as they think should receive special attention.

MEASLES IN A STATE INSTITUTION

BY A. B. MOULTON, M. D., *Faribault, Minnesota.*

Sometimes it seems as though, in medicine as in journalism, only the new and the sensational attracts and stimulates to great activity. The new danger, as expressed in a disease with which we are unfamiliar, rouses us and calls forth the most stringent measures for its suppression, while the danger, ever present in such a disease as measles to which mankind seems universally susceptible, receives scant consideration.

A study of measles and its epidemiology has convinced us that we have to deal with a disease fraught with much danger, where a physician's watchful care is needed till all probability of complications has passed. Let us remember that during the past year there were in the aggregate more deaths from measles in the United States than from scarlet fever, and in some states where the reports were closely followed up, the total deaths from scarlet fever and diphtheria were slightly less than from measles. These figures do not take into consideration the mortality incident to broncho-pneumonia and other complications where the underlying measles were disregarded when the death certificate was signed.

In dealing with measles in our institutions, there are certain phases of the problem that are not apparent and do not appeal to the casual observer and it is to these special features, as they affect us and our charges, that we wish to call attention. The epidemic of measles through which we have recently passed has rendered specially vivid certain points relative to the disease, its dangers, and the difficulties in its control. While the death rate from measles occurring among normal children in good health, endowed with a reserve-store of hereditary vitality, nourished by a carefully selected, well-balanced dietary, living a free, out-of-doors life under the special care of a mother or nurse, is low, such is not the case where we have to deal with the poor unfortunate defectives in our institutions. These children, heir to a constitution weakened by parental excesses or diseases, crippled in mind and body, many already infected with

tuberculosis, with sluggish circulation, blunted sense perception, and slow or absent voluntary and involuntary muscular response to normal stimuli, are rendered more susceptible to complications, thereby raising the death rate very materially. Even though our authors give the death rate from measles in hospitals as two to three times the mortality among children in private practice, yet few realize that at times this disease in its ravages mows down its victims like the plague. This is shown very forcibly by the following: During five years at the Hospice des Enfants Assis, of Paris, there were 1575 cases with a death rate of 46.22 per cent.; at l'Hospital des Enfants Malades, during seven years there were 2585 cases and a mortality of 40.15 per cent.; and during five years l'Hospital Trousseau, of Paris, there were 900 cases and a death rate of 25 per cent. In our epidemic we feel that we have been quite fortunate, having a death rate of 8 per cent. in 100 cases. Two other deaths occurred, one from epileptic convulsions during convalescence and one from tuberculosis. In the latter case the patient was in the last stages of the disease when attacked by measles.

Among the interesting and highly suggestive features in this outbreak, the following seem worthy of note: We had two foci of infection in separate buildings, the one designated A was contracted in town; the second one, B, appearing nearly at the same time, was in another building with no contact with the previous case, the source of infection being unknown. The cases can be grouped and identified as coming from the one or other of these sources by the symptoms and general trend of the disease. Group A was characterized by marked symptoms of toxemia, high fever, livid rash, rapid pulse, sordes and mental dullness, while group B showed less signs of toxemia and a greater liability to catarrhal complications. Group A, though occurring among adults of a higher physical and mental grade and numbering only fourteen cases, was responsible for two deaths or 14.287 per cent., while the other eighty-eight, occurring in a lower grade of children among whom were the babies, had only six deaths or a mortality of 6.81 per cent. It is of importance to state that following convalescence two of the patients in group A developed tuberculosis. The onset in the first case,

an employe, being insidious, while that in the second was sudden with a profuse hemorrhage. Having in mind the question of etiology, these facts hint at an infection by some micro-organism, which in these two instances were of different strains, having a varying degree of virulency. There was but one case presenting great clinical interest, that one resulting in death from pulmonary gangrene subsequent to a complicating broncho-pneumonia, the child just prior to death showing a temperature of 107.2. (Temperatures of 105 degrees were common.)

Recognizing measles as a serious disease among normal children, and convinced it is one to be especially dreaded in an institution for defectives where large numbers of children are brought into close association, and realizing the necessity for adopting measures to prevent its entrance or spread, how can we control it? We have to deal with one of the most contagious of diseases, an infection which may be brought to us by new arrivals, employes or casual visitors; an exanthem which may be readily confounded with German measles, or in some instances with scarlet fever, and worst of all, a contagion which is often infectious to others before a diagnosis can be made. What can we do? In our institutions we have a limited corps of attendants and nurses; we have oft-times to deal with help that object to any change in their regular routine, chafe if called upon to do extra work or give up their "hours off" and not infrequently rebel and resign if the measures adopted to control the situation restrict in any way their movements. We have to consider the parents of such children as are not stricken but may be exposed at any time, remembering at all times that they will be greatly alarmed at the report of a contagious disease in the institution; that they will object to any unusual limitations in the social life of their child; also remembering that in the minds of the laity no one ever dies of measles. Could we but remove the cause by preventing the introduction of that first case, our problem would be solved, but how can this be accomplished? We often hear the opinion expressed that a detention pavilion would solve this problem, but would it? If we isolated each incoming member of our household, we should still be open to the danger of our employes or visitors bringing it to us. This incubational

detention seems impracticable as it requires extra help, greater expenditure in wages and for buildings and, moreover, keeps the child under restraint at a time when most of all it needs to be with the other children. Then, too, it would not bring about the desired end.

It seems that the only endeavor that can possibly bring commensurate benefit is to limit to a minimum the spread of the disease when it makes its appearance. Provide a hospital, ward, or rooms for such cases and transfer each case as quickly as discovered to the isolation hospital; in so far as possible, by questioning, and the information given on the application blanks, determine those among the contacts who have not had the disease; if possible, quarantining all contacts during a period between the seventh and twenty-first day after exposure, sending each to the hospital as it develops; no case to be discharged from the isolation hospital or ward till all catarrhal symptoms have disappeared and desquamation is complete; all handkerchiefs and linen soiled by discharges from nose and throat to be boiled.

It is often stated that the spread of measles in a building where it has once appeared cannot be checked until all susceptible individuals in the building have had the disease. This has not been our experience. In one building, housing 203 children, the disease made its appearance in three grades out of five. In one of these three, almost every child was affected, while in the third, only two cases appeared. Besides the hundred children in the two grades unaffected, there were two children of employes living in the building that escaped the infection.

Since it is very seldom, if ever, that measles is carried by a third person, strict quarantine over the nurses in the isolation hospital need not be enforced, and there will be less difficulty in holding the nurses to their duty. This is extremely important where we have to draft into the nursing service attendants and other employes. Where these suggestions can be carried out, we feel sure that the infection should not spread beyond the grade or building in which it originates.

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EDITORIAL

UNIT CHARACTERISTICS AND MENTALITY.

A suggestion is offered by Dr. Davenport in his work referred to elsewhere—that future progress in classifying defective mentality, and by inference in determining definite inheritance of mentality, must be based upon previous determination of unit characteristics.

This is a suggestion well worth consideration. The most important feature of Mendel's work was not in the discovery of the mathematical relation existing between the dominant and recessive characters, interesting and important as this was, but it was the conception of the idea of the physical unit characteristics of a plant and the determination of the fact of their existence by experimentation. The work in cross fertilization was

primarily a verification of the predetermined selection of unit characteristics.

It is true that from the very nature of mental phenomena, the problem is much more subtle, and one could hardly hope to discover unit characteristics in the superficial functioning of the brain. But, may it not be perfectly possible to group certain mental and moral manifestations as syndromes, characteristic of definite types of mind?

REVIEWS AND NOTICES

Heredity in Relation to Eugenics. CHARLES BENEDICT DAVENPORT. *Henry Holt & Co. N. Y., 1911.*

This is a clearly written and well illustrated presentation of the latest and best ideas upon the subject. Dr. Davenport is himself an authority on heredity, being the director of the department of Experimental Evolution at Cold Spring Harbor, N. Y., of the Carnegie Institute of Washington, and secretary of the eugenics section of the American Breeders Association. He has done much original work in breeding, especially of poultry, determining the dominance of physical characteristics (Carnegie Institute Pam. 52), and in interpreting the hereditary values of eye color, hair pigment and form. He has done more than any other American in collecting data of other investigators and interpreting its hereditary value in the light of Mendelism, as well as stimulating research generally along all lines of eugenics. His experience and observation have been such that anything published by him carries with it an authoritative value.

Without attempting any analysis of his conclusions in this book, it is sufficient to say that every one interested in this important subject should possess a copy of the work. It is scientific and yet written in a popular style and forms a complete compendium of the modern ideas on the subject.

A. C. Rogers.

The Defective Delinquent Class Differentiating Tests. GUY G. FERNALD. *The American Journal of Insanity, April, 1912. Pp. 523-594.*

The defective delinquent is regarded as belonging to a more or less separate class. Intellectually, he is placed between the highest grade feeble-minded, the morons, and the normal, and is formally defined as "one whose mentality is so imperfectly developed that he is unable to support himself honestly, and whose acts repeatedly conflict with established social and legal requirements." Methods of diagnosing this grade of mental deficiency are yet to be established and standardized, and to contribute to this end the

author reports a number of mental tests and results obtained with them in examining 100 representative cases from among the inmates of the Massachusetts Reformatory at Concord. Twelve different tests were tried out, five of which were finally eliminated as unsatisfactory. The remaining seven are as follows: 1. Weight discrimination. The subject has to arrange a series of ten weights in the order of their weight, the weights beginning with 50 grams and increasing by four gram steps to 86 grams. 2. Ethical discrimination. The subject is given a statement of ten different offenses, which he is asked to arrange in the order of their gravity. This is not intended to measure morality, but "intelligence or judgment employing ethical entities as integers." 3. Achievement capacity. The subject is asked to stand with his heels raised as long as he can. A dial and pointer of a specially devised apparatus register in his sight the amount his heels are raised or lowered, and an electric bell rings when they are entirely down. 4. Extent of movement. The subject passes his pencil five to six times along the length of a twenty centimeter scale. The scale is removed and he immediately tries to draw a line of exactly the length of the scale. 5. Recognition memory. The subject is shown ten picture postal cards as they are placed before him one at a time. The cards are immediately taken up again and shuffled with ten similar ones and the subject tries to pick out from the twenty those he recognizes. 6. Calculation. The subject is asked to count backwards from twenty by twos, then backwards from thirty-one by threes. 7. Cancelled numerals. The subject crosses out all the ciphers in a page of twenty lines of fifty numerals each. Detailed directions for conducting each test are given, together with results with these tests with normal persons. The norms were furnished by J. W. Wood, Jr., and his teachers from the senior class of the Rindge Manual Training School of Cambridge, Massachusetts. In the scores for the tests the time alone is considered in "3," the errors alone in "1," "2," "4," and "5," and both time and errors in "6," and "7." The results are given in terms of averages, medians, modes, average deviations, standard deviations, and probable errors. The following is from one of his tables:

Tests—	1—Per Cent.			2—Per Cent.			3—Min.		
	Av.	A.D.	P.E.	Av.	A.D.	P.E.	Av.	A.D.	P.E.
Reform	81	12	11.5	62.5	15.5	13.9	17.3	8.6	7.9
Norms	90.7	5.1	4	71.2	6.5	6	52.5	37.2	36.6
Tests—	4—Min.			5—Per Cent.			6—Per Cent.		
	Av.	A.D.	P.E.	Av.	A.D.	P.E.	Av.	A.D.	P.E.
Reform ..	21.8	11.7	9	76.6	10.1	7.1	74.1	19.5	16.9
Norms ..	6.2	6.6	5.6	80	6.7	5	92	9.6	10

It will be noticed that these figures show a good difference in favor of the norms in nearly all cases. The article closes with thirty-eight pages of clinical notes in small print on the 100 cases examined with the tests.

The study is a valuable contribution to the problem, made in the right spirit, apparently carefully carried out and the results well analyzed. There

are a few general observations which the present writer's endeavors along the same line lead him to make as suggestions rather than as criticisms. (1) The tests are on the whole not of a nature best adapted for making the diagnosis of small differences in intelligence of adults near the border line of the normal. Tests which are difficult to do in order to make any score at all, which involve complex mental processes rather than simple, and which require more than merely voluntary effort to make a good score are in general better adapted to this purpose. (2) The results should be scored so as to represent accurately the total mental performance in the test, both the time and the errors being always taken into account. (3) The scores in the norms given are probably considerably higher than they would be for really average normal individuals since the subjects were all chosen from among seniors in a college class.

Faribault, Minnesota.

F. Kuhlmann.

Schwachbegabte Schulkinder. Vorgeschichten und aerztliche Befunde.

E. SCHLESINGER. *Stuttgart: Verlag von Ferdinand Enke, 1907. S. 1-63.*

A special study was made of 138 children of the Hilfsschule. The results are given in the form of statistics and generalizations from them. It is comprehensive in scope, covering practically the whole field of inquiry. Thus, the first section deals with the findings in regard to the family histories in these 138 cases, and discusses hereditary causes. A second section deals with the personal histories of the children during infancy and discusses post natal causes. The third, to which half the monograph is devoted, considers the condition of the children at the time of the study. This last section covers physical examinations, some anthropometric measurements, and mental examinations. For the last, general observations and school work are relied upon, no systematic testing having been done, apparently. The study is of value more as a model of comprehensiveness in giving results on a large number of different aspects of the subject for the same group of children than as a contribution establishing new facts in any of these lines. For the latter purpose the number of cases is too small, making most of the statistics by themselves alone inadequate for much generalization.

Faribault, Minnesota.

F. Kuhlmann.

Die aerztliche Feststellung der verschiedenen Formen des Schwachsinns in den ersten Schuljahren. L. LAQUER. *Zweite vermehrte und verbesserte Auflage. Muenchen: Verlag der aerztlichen Rundschau (Otto Gmelin), 1909. S. 1-37.*

The stated object of this brief monograph, as indicated by the title, is to discuss the determination of feeble-mindedness in its different degrees in the first years of school life. This discussion is given on the basis of much per-

sonal observation and experience of the author as school physician for a number of years. One naturally expects much from this title and announcement, but is soon disillusioned in finding this subject covered in thirty-seven pages, a third of which is given over to quite irrelevant matter. A few pages are given to a description of the general characteristics of the three grades of feeble-mindedness, followed by a few paragraphs on the present status of the Hilfsschule and medical inspection in Germany. Next are given two record blanks, one devised by the author, the other by H. Horrix. These present no new features, but cover the usual ground about parents and defective children in quite the usual way. They call for a variety of information, which would be indeed valuable if obtained, but nothing is said as to methods of doing so. The last part of the monograph is given to a discussion of the home, physical, and mental conditions of the parents, and the physical, mental, and moral development of the defective children.

Faribault, Minnesota.

F. Kuhlmann.

NEWS AND NOTES

The meeting of the Association for the Study of the Feeble-Minded during June at Vineland, N. J., in conjunction with the National Association for the Study of Epilepsy and the Care and Treatment of Epileptics, was unique in its history for the large attendance and the joint sessions with its sister organization. The work of both societies has very much in common and there is a very cordial fellowship between the active members of both organizations. An occasional joint meeting would be helpful and stimulating.

One of the most interesting studies of the Vineland pedigree work is what is known as that of the Kalikak family. This is now being published by Dr. Goddard.



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PRESIDENT'S ANNUAL ADDRESS

BY H. G. HARDT, M. D., *Lincoln, Ill.*

Ladies and Gentlemen, Members of the Association: Being unable to be present at the last meeting, I take this opportunity to express my profound appreciation of the high honor conferred in making me the presiding officer at the last election. I feel thankful beyond words, as my entrance into this work has been but of few years' standing and with permission I will limit my remarks in order to give the added time to the excellent program which has been arranged.

Let us, for a moment, recall the scene of the first gathering which met at Media, Pennsylvania, June 6th, 1876, just about thirty-six years ago. There were present Doctors H. B. Wilbur, G. A. Doren, C. T. Wilbur, H. M. Knight, I. N. Kerlin and E. Seguin. At this time Dr. Seguin was made the first president. Think what a small nucleus was the beginning of our present association. Would not the hearts of those who first conceived the thought of the association be filled with joy and gladness to see the healthy growth to which it has attained? In the light of recent events I call attention to article 2 of the constitution adopted at the first meeting which reads as follows:

"The object of the association shall be the discussion of all questions relating to the causes, conditions, and statistics of idiocy, and to the management, training, and education of idiots and feeble-minded persons; it will also lend its influences to the establishment and fostering of institutions for this purpose."

This gathering was first called as a meeting of superintendents. Later it was known as The Association of Medical Officers of American Institutions for Idiotic and Feeble-Minded Persons, and now it is known as the American Association for the Study of the Feeble-Minded. The title is so charitable as to take in any human being who is willing to assist in unraveling the mysticism which still envelops to a marked degree the study of the mentally defective.

It has been said that parentage is altogether too much a matter of private adventure and the individual family is altogether too irresponsible. As a consequence there is a huge amount of avoidable privation, suffering and sorrow. A certain vice commission has tersely put it as follows: "An applicant for a license of any kind, whether it be to construct a house, run a push cart, peddle shoestrings, or keep a dog, must be accompanied with evidence that the applicant is a responsible and reliable agent. But for a marriage license, one person unattended and unknown, and, as far as one can know, an epileptic, a degenerate, or who has in his blood a loathsome venereal disease, may pass his name through a window with that of a similarly questionable female, likewise unknown, and be granted the divine right to perpetuate his kind in turn, thereby placing a burden and a blight on society and the community for generations to come.

"That the segregation of defectives costs money is remembered; that it saves money is often forgotten. The initial cost of segregation would be great, but the saving effected by correcting our present lax methods would be greater. As tax bills are not itemized the ordinary citizen does not realize that he is at present paying for the unrestrained presence of the feeble-minded. An added tax for their segregation would be an apparent rather than a real increase, for through segregation of defectives the number of criminals, the number of prisoners, the cost of trials, the demand upon public and private charity, would be decreased; and as control of hereditary conditions resulted in decrease in the number of defectives, and training rendered many of them nearly self-supporting, the expenditure necessary for their maintenance would from year to year grow less."

Every child has the inherent right to be well born. We are here today as representatives of a section of that great charity and humanitarian problem whose arms extend over the civilized world. We assemble year after year to disseminate whatever has been discovered in our various fields of endeavor and confess our mistakes to aid others, and we also come to correct our methods by the aid of the experience of our associates. The subjects which will be placed before you for discussion should be thorough and freely discussed, not to pronounce judgment but to welcome discovery—not to formulate abstract principles but to publish facts, to create enthusiasm, and to learn truths.

In reviewing institution service of the past few years, I cannot help but be impressed with the fact that the prayer or petition of Mr. Johnstone, made at Faribault in 1904, has in a measure been answered. A staff of psychologists have appeared and are ably at work at the several institutions. In the splendid and startling results secured let not the medical factor be obscured. The trained physician and the trained psychologist should work hand-in-hand to clear this mental complex. In fact the laboratory should extend its arms to the pathologist, psychologist, biologist, or to any other human being who is willing to assist with might and main in this noble cause. It is for the superintendents and managing officers of these various departments and institutions to encourage this army of workers. It demands a strong, healthy, continuous, financial support, as well as encouraging words and deeds and a helping hand when troubles are most perplexing.

For a number of years we have had as members or guests, members of the Association for the Study of Epilepsy. This year we are extremely pleased to have meet with us, The Association for the Study of Epilepsy. We all know how closely correlated their and our work is, and I trust this joint meeting will be of the greatest mutual benefit.

Allow me to congratulate the association upon the auspicious opening of this the thirty-sixth session which is due first of all to Mr. E. R. Johnstone, and his able corps of assistants; next to the fidelity and wisdom of the co-laborers, the officers and committees of this body, and I trust that the high courtesy and

generous fellowship which have made our former meetings agreeable, and the discussions and enthusiasm which have made them so profitable and influential will reign here and make this the best and most helpful meeting yet held.

A STUDY OF SPEECH DEVELOPMENT IN TWO HUNDRED AND EIGHTY-FIVE IDIOTS AND IMBECILES

BY CLARA HARRISON TOWN, Ph. D., *Director of the Department of Clinical Psychology, Lincoln State School and Colony, Lincoln, Illinois*

In **L'Anee Psychologique** for 1908 there is an article by Binet and Simon entitled "Langage et Pensee." In it the authors have outlined what they call a new psychogenic method, a method which they judge can with profit be applied to the study of most mental phenomena.

The method is not so much an application of the psychogenic method to the study of the feeble-minded as a study of psychogenesis by means of the feeble-minded. Genetic studies of mental phenomena have heretofore used as subjects normal children. Such studies are more or less hampered by the fact that a normal child evolves so quickly that his mental level is in reality not a level at all, but a constantly ascending plane. The feeble-minded, on the contrary, according to these authors, reach planes of mental development corresponding to certain stages of normal development and remain there. An average child of five years possesses a certain mental development, plus an actively and constantly exercised power to acquire more. A feeble-minded adult with the mental development of a child of five possesses a similar mental development without the power of further development. He has reached a distinct level of development, a static state, and may be studied at leisure.

Thus by studying any mental phenomenon in groups of feeble-minded individuals of each mental age from two years to that age period in which the phenomena in question normally reaches full development, we should be able to gain a knowledge of the gradual evolution of that phenomenon. In illustration of the method the authors present a study of the language development of several imbeciles, and reach some interesting conclusions, among them the following:

1. The auditory vocabulary based upon the power to understand spoken words is largely developed before the ability to speak is acquired.

2. The ability to repeat words precedes the ability to use them voluntarily and intelligently.

3. Language development reaches such a high level by the age of seven that any individual limited to the intelligence of that of a child of seven, is not in consequence of such limitation deprived of free and fluent use of language. This, of course, has a very direct bearing upon recent theories of aphasia.

Following the lines of investigation laid down in this article we have attempted the study of language development in a number of idiots and imbeciles, charges of the Lincoln State School and Colony. Two hundred and eighty-five children form the basis of the study—fifty idiots, ninety low grade imbeciles, forty-five middle grade imbeciles, and one hundred high grade imbeciles, all graded and classified according to the Binet-Simon scale. Among the idiots five levels of language development were recognized: the understanding of gestures, the imitation of gestures, voluntary gestures, the understanding of words heard, sounds and attempts at articulation. The idiots were sub-divided into three groups—seventeen low grade, eight middle grade, and twenty-five high grade idiots. Of the seventeen low grade children there are two who understand gestures, none who imitate them, four who make occasional use of them, one who understands a few words, and none that speak so much as a single word. Two laugh, two hum, and the others grunt, scream and cry only. Of the eight middle grade children two understand gestures, one imitates them, two use them voluntarily, three understand a few words, one speaks a few words, four laugh, the others cry, scream and make inarticulate sounds. Of the twenty-five high grade idiots, twenty-three understand gestures, twenty imitate them, at least occasionally; twenty-two use them voluntarily, at least occasionally; fourteen understand a few words, and ten pronounce one or more.

Thus we find a gradual development of the faculty of expression through these grades of idiocy. In all three grades

there were a few more children who used gestures voluntarily than there were children who imitated gestures. In all cases, however, in which this voluntary power develops before imitation it seems to be limited to movements of prehension or repulsion. It is the direct result of pressing need and desire for expression. The rudimentary attempts at articulate speech are evident in the highest grade idiots, and the most striking finding of all is that many of these children who can say nothing, or at the most, "yes," "no," and "mama," understand the names of many familiar objects and acts.

With the imbecile we reach the plane of articulate speech, and the problem of examining the language ability assumes a different form. The ability to gesticulate is now taken for granted and the points to be observed are:

1. The size of the auditory vocabulary.
2. The size of the spoken vocabulary.
3. Echolalia.
4. Power to repeat sentences.
5. Voluntary speech—words and sentences.
6. Defects of articulation.

Defects of articulation are in turn classified as follows:

1. Stammer—infantile.
2. Stammer—more persistent and more general.
3. Stutter.
4. Vagueness without distinct stammer.
5. An omission or slurring of letters and syllables.
6. An omission of words in sentences.

The vocabularies are designated as consisting of the names of a few objects and acts only, or as general. Of the ninety low grade imbeciles, eleven per cent. show the limited auditory vocabulary, fifteen per cent. the limited spoken vocabulary, while the middle and high grade imbeciles all possess general vocabularies. As such a summary statement gives little or no idea of the size and character of the children's vocabularies, a special study was made of the vocabularies of twenty-five low grade, ten middle grade, and ten high grade imbeciles. As it seems quite impossible to procure complete vocabularies of large

groups of children, a comparative study was made on the basis of the power to use voluntarily three hundred and twenty selected words. These three hundred and twenty words were suggested to each child by means of pictures and objects. These were shown to the children and they were asked questions concerning them. Of course each child was taken alone and encouraged to talk as much as he would. As most all children like pictures the whole thing became an enjoyable game. A record was kept of each of the three hundred and twenty words used and also of all extra words used during the course of the experiment. The average per cent. of the three hundred and twenty test words used by the groups grading in mental age from three to six shows a gradual increase as the mental age increases. The three-year group shows an average of twenty-three per cent. with a mean variation of eight and one-half per cent.; the four-year group an average of forty-one per cent. and a mean variation of seven and one-third per cent.; the five-year group an average of sixty-nine per cent. and a mean variation of seven and six-tenths per cent., and the six-year group an average of eighty-six per cent. and a mean variation of two and nine-tenths per cent.

A similar gradual and regular increase is shown in the total number of words used (this total including the words used which were not among the test words). The average for the three-year group is one hundred and twelve; for the four-year group, one hundred and eighty-eight; for the five-year group, three hundred and fifteen; and for the six-year group, three hundred and sixty-three. The test was not carried on to the seventh year of mental development because the vocabulary at this level is so large that this test on the basis used is of no value. An interesting point brought out by these vocabulary tests is the comparatively large vocabularies, fifty, seventy-five, or one hundred words, possessed by the silent children, regarded as mute by many of their attendants.

The tests were also of inestimable value as a help in the analysis of articulation difficulties. One little boy is recorded as having used two hundred and fifteen words, whose speech without the guide of the pictures is absolutely unintelligible.

With the pictures one can grasp the faint resemblance to the word attempted and thus gain a true conception of the child's distorted perception of the word. The phrase **perception of the word** is used designedly; probably no one realizes how intimate is the connection between the faulty articulation of a word and its auditory value to the child, and still further between both of these and the ideas they convey. Many children are absolutely incapable of sensing more than one or two sounds in a word. One little boy had learned the word **heaven**, or for him **hev**. When I asked him which of two blocks was the heavier he seemed confused. I said, "What does heavy mean?" He pointed upward. Several children when asked what they would do if on their way to school they feared they would be late, thought that **late** meant **lake**; one thought he would solve the problem by swimming across; another, that he would hunt up a boat. These children habitually changed final **k** to **t**, and **late** and **lake** are identical to them. Another boy when asked to write the word **tree** made the figure **3**; for him **th** is always **t**. Still another boy was asked to name a bottle which was held up for inspection. He said, "It is medicine." As a further suggestion for the word **bottle** he was then asked, "What is it in?" To this he replied, "Budesedine." The question was given too rapidly for him, and he was making an effort to repeat exactly what he heard, thinking it was some new word, the name of the medicine.

The records show the occurrence of echolalia in nineteen per cent. of the ninety low grade imbeciles, all cases but two occurring in the three-year group; in two per cent. (one case) of the forty-five middle grade imbeciles; and in two per cent. of the one hundred high grade imbeciles. These findings indicate that echolalia is a phenomenon generally outgrown by the end of the third year. The power to repeat sentences is possessed by fifty-two per cent. (forty-seven) of the ninety low grade imbeciles and by all the other children. The ability to use sentences voluntarily appears in seventy-two per cent. (sixty-five) of the ninety low grade imbeciles and in all the other children. Again, it seems that the ability to use voluntary sentences precedes that of repeating sentences, or at least is more general at

an earlier age. Many of the children included in the seventy-two per cent. are, however, capable of only very short sentences and badly constructed ones. Of the ninety low grade imbeciles there are only thirteen free from defects of articulation; eighty-five per cent. of these children either stammer, stutter, or slur their words or sentences. Sixty-two per cent. (twenty-eight) include all those whose articulation is defective in the group of middle grade imbeciles, and fifty-five per cent. all those in the group of high grade imbeciles. If under faulty articulation we included all those departures from the absolute purity demanded by the highest culture, of course these percentages would be much higher. Those errors common to the entire communities from which our children come do not indicate faulty development of function, but faulty speech models which have been correctly imitated. Therefore such errors are not included in our totals, which represent faulty development of the ability to articulate. Sixty per cent. of the ninety low grade imbeciles stammer; fifty-three per cent. of the forty-five middle grade imbeciles stammer, and forty-eight per cent. of the one hundred high grade imbeciles stammer. The stutterers number three and three-tenths per cent. (three) of the low grade imbeciles; four per cent. (two) of the middle grade imbeciles, and three per cent. of the high grade imbeciles. Stuttering is comparatively unusual among the feeble-minded at the Lincoln State School and Colony and seems to have no age correlation. Those who have defects of articulation other than stammering and stuttering, number twenty-two per cent. in the group of low grade imbeciles; five per cent. in the group of middle grade imbeciles, and four per cent. in the group of high grade imbeciles.

In summing up the results of our investigation we find that our records show a distinct age correlation for the successive levels of language development, and just as distinct an age correlation for the various speech defects, with the single exception of stuttering. Such results are indicative that this new psychogenic method will in time contribute many valuable data concerning the development of the intelligence.

LANGUAGE DEVELOPMENT OF IDIOTS

	Low Grade	Middle Grade	High Grade
Total Number	17	8	25
Understands gestures	2	2	23
Imitate gestures	0	1	20
Voluntary gestures	4	2	22
Understand few words	1	3	14
Speak word or two	0	1	10

LANGUAGE DEVELOPMENT OF IMBECILES

	Low Grade	Middle Grade	High Grade
Total Number	90	45	100
Auditory vocabulary—general	89%	100%	100%
Auditory vocabulary—limited	11%	—	—
Spoken vocabulary—general	85%	100%	100%
Spoken vocabulary—limited	15%	—	—
Echolalia	19%	2%	2%
Repetition of sentences	52%	100%	100%
Voluntary sentences	72%	100%	100%
Stammer	60%	53%	48%
Stutter	3.3%	4%	3%
Other defects of articulation	22%	5%	4%

RESULTS OF VOCABULARY TEST.

Low Grade Imbeciles—Mental Ages three and four Years.

Case	Age	Mental Age	Number of Test words	Per cent. of Total Number Test words	Words used
1	7	3	30	9	34
2	12	3	32	10	50
3	10	3	40	12	152
4	6	3	48	15	76
5	7	3	53	16	57
6	6	3	60	19	138
7	9	3	72	22	113
8	7	3	81	25	125
9	6	3	81	25	110

10	7	3	84	26	151
11	7	4	90	28	114
12	7	3	101	32	137
13	8	4	105	33	153
14	11	4	115	36	136
15	9	4	115	36	146
16	13	4	115	36	226
17	11	4	117	37	162
18	17	4	121	38	159
19	28	3+	128	40	148
20	9	4	135	42	231
21	26	3+	139	43	167
22	14	4	143	45	194
23	14	4	151	47	196
24	9	4	172	54	248
25	14	4	195	62	293

Mental Age 3.

Mental Age 4.

Av. % 23, M. V. 8. 5.

Av. % 41, M. V. 7. 3.

Av. Total, 112, M. V. 36.

Av. Total, 188, M. V. 45.

RESULTS OF VOCABULARY TEST

Middle Grade Imbeciles—Mental Age five Years.

Case	Age	Mental Age	Number of Test words	Per cent. of Total Test words	Number Words used
26	13	5	155	48	216
27	11	5	202	63	358
28	7	5	211	65	291
29	8	5	213	66	316
30	9	5	216	67	288
31	10	5	223	69	304
32	12	5	245	76	400
33	13	5	249	77	322
34	11	5	257	80	280
35	11	5	265	83	380

Mental Age 5.

Av. % 69, 4, M. V. 7. 6.

Av. Total, 315. 5, M. V. 39. 7.

RESULTS OF VOCABULARY TEST

High Grade Imbeciles—Mental Age six Years

Case	Age	Mental Age	Number of Test words	Per cent. of Total Test words	Number Words used
36	11	6	250	78	293
37	9	6	266	83	315
38	12	6	271	85	352
39	10	6	273	85	363
40	11	6	276	86	492
41	14	6	276	86	296
42	10	6	278	87	346
43	13	6	284	88	380
44	12	6	294	92	375
45	9	6	299	93	420

Mental Age 6.

Av. % 86. 3, M. V. 2. 9.

Av. Total 363. M. V. 42. 8.

DISCUSSION

Dr. G. Hudson Makuen: Mr. Chairman, ladies and gentlemen—I am very sorry that I did not have Dr. Town's admirable paper in my hands for careful perusal before I came down here so that I might have prepared a discussion which would have been worthy of the subject and of the occasion. Some of you know that I have long been of the opinion that the study of speech is the shortest and most direct route to mentality; that it serves as the best diagnostic test of the degree of feeble-mindedness, and not only so, but the training of speech is the best all-around training, in my opinion, for feeble-minded children, especially for those who are susceptible of this training. Of course it requires a certain amount of underlying physical basis for the kind of training of which I speak. To use a homely expression, "You can't make a silk purse out of a sow's ear," but the child who has sufficient mentality to be trained in speech is the child for which we have some hope in the future. One of the most difficult things which I have to do in my practice is to diag-

nosticate off-hand the degree of feeble-mindedness of a child, but I have facilitated that matter so much now that it is not necessary, as some one said here this afternoon, any longer for me to live with a child a year to know whether he is feeble-minded or not, but I apply the speech test and in a few minutes I think that I can "size up the situation," as the saying is. My plan is first to make a careful physical examination of the child and then refer the child to an adjoining room in which I always have an especial assistant for the training of speech of my patients, an expert teacher who has been well trained. I know this because I trained her myself. After leaving the child with her for fifteen or twenty minutes, and after I get her speech test, I think I can tell pretty well what the future possibilities of that child may be, and I think I can tell this because in making the speech test the child's power of attention, of concentration, of ambition, and of memory is measured. The speech test includes the testing of all these mental faculties. Dr. Town spoke of certain cases of mutism. I recently read a paper on deaf mutism. I said in that paper that you may differentiate three kinds of mutism, the mutism of deafness, the mutism of idiocy, to use that in a broad sense, and idiopathic mutism. Now many of these supposedly feeble-minded children or the borderline cases, in my experience, are not really feeble-minded. I believe that when we perfect our system of training and education—and by the way we haven't perfected it by any means—a great many children who pass now for feeble-minded will not be considered so at all. Dr. Fernald spoke this afternoon with reference to the early beginning of the training or the treatment of the feeble-minded child, and he said, among other things, that we now might or may begin the treatment of feeble-minded children early because of the compulsory law for attending schools, and so forth. Now in my opinion that is too late to begin the treatment of a feeble-minded child. I know there are requirements in favor of letting the feeble-minded child run wild just as there have been requirements in letting a deaf child go for the first six or seven or eight years of its life. I think there is a more marked analogy between deafness and feeble-mindedness. I have always been of the impression that

feeble-mindedness is a condition, that feeble-mindedness like defects—like congenital defects, for instance—is a condition, a result of a disease, if you please, rather than a disease proper. This is an important point, I think, especially as bearing upon the question of inheritance, because if feeble-mindedness is only a result of disease, then we can in our prevention of feeble-mindedness not only prevent the intermarriages of feeble-minded people but we must prevent the intermarriage of people who have constitutional diseases which may produce feeble-mindedness, and you know that is quite possible; just as constitutional diseases produce deafness, so constitutional diseases produce feeble-mindedness, and by the way, speaking of deafness—and I know more about deafness than I do about feeble-mindedness as some of you will think, perhaps, before I get through—but speaking of deafness and heredity, there are more deaf mutes who are the results of the intermarriages of blood relations than there are from the intermarriage of deaf mutes; so that is a point, it seems to me, that we should take into consideration when we consider the question of inheritance, of heredity, in connection with feeble-minded children. Now I have been exceedingly interested in Dr. Town's paper and as I say, I should have liked to have gone over it before and studied it more carefully in order that I might have discussed it more fully and more satisfactorily. It seems to me that it is a valuable contribution to this subject. It seems to me that the study of speech development, of language development is the best test of their mental development. By the way, I thought that Dr. Town used those two words rather loosely if she will excuse me. Of course, as she knows, every animal and every idiot has language of some kind but man is the only animal who has speech, so that the articular muscles have been called the mental muscles. No animal has yet been found that has a sufficient amount of mentality to conduct a conversation. Some of them have used words and detached words, and so forth, but man is the only one of all who has speech and as you know that is our distinguishing characteristic—speech development and the command of speech. Speech is, as I say a little different from language, and it is different from voice; articulation and pro-

nunciation are different. They are differently represented in the brain, for instance. The center of phonation is not exactly in the same place as the center for articulation, and in the teaching of the deaf, you don't hear the sound at all. They go slowly, see the motions of the lips. They see all the speech there is. There is no sound in speech. I really mean to say that phonation is not an essential element of speech. (Here Dr. Makuen moved his lips apparently without any sound issuing therefrom.) Some of you can understand what I say without respiratory quality, even without a whisper, so that speech, strictly speaking, is what you see and you don't see it all but you see a great deal of it, and the use of the speech muscles requires a better all-around general degree of mentality—to use that expression—than the use of any other muscles of the body. Therefore, I think that the study of the speech and speech development of children generally, is the best test of their mental development, and I say that the powers of mental development and the training of the speech is the best training they can have because it involves so many of the mental faculties.

(Dr. Makuen here exhibited charts showing cortical areas and sensory centers of the brain involved in speech.)

Of course, these are not accurately and well defined centers as they are on this chart, but they are always found in the same particular region of the brain and it seems to me that they ought to settle the point as to whether or not there is a physical basis for defects of speech or things of that sort—the fact that these special centers for the externalization of speech are always found in exactly the same place. There is the center for the movement of the hand in writing, known as the Chirio Kinaesthetic center, and there is the speech center proper, the center for the movement of the tongue and lips and all muscles which are employed in articulation. Now I spoke of the speech test for the feeble-minded. When you examine, as Dr. Town has examined, these children, what are you doing? You are testing, actually testing the condition of these special centers of the brain. She knows when she gets through with this auditory word center whether the child is capable of developing and receiving and retaining auditory mur-

murs. In other words, the child thought she said "lake" when she said "late." In that child the auditory center was not acutely accurate. That child could not easily distinguish between "late" and "lake". It may be that Dr. Town's articulation when she was talking with the child was not quite sharp enough. Dr. Town said another thing that surprised me. She said that thirteen per cent. of these feeble-minded children—only thirteen per cent.—had no defects of articulation. That surprised me. I never saw a feeble-minded child yet that had no defects in articulation, in my judgment. Now of course that may be a matter of personal equation. Dr. Town may not be so particular about articulation as I am. I mean her standard may not be quite so high. Now to say that one has no defect of articulation cannot be said of many people. I am sure that it cannot be said of me because I, in speaking to you, have some defects in articulation of which I am absolutely sure. I do not notice them, of course, all the time but if I had a perfect phonographic record of my articulation it would be imperfect. I do not find people with no defects of articulation. It is not a criticism but just a little point I want to call attention to—illustrating the fact that we all have some defect of articulation. The speech is such a complicated thing that to be perfect in it you must keep working at it all the time, and practicing it all the time, just as these great orators and great speakers keep practicing all the time to keep themselves in good condition. I thank you.

REGARDING SPECIAL CLASSES FOR SUB-NORMAL CHILDREN

BY GRACE M. BOEHNE, *Director of Child Study Laboratory, Rochester Public Schools, New York.*

At the outset one might open a discussion as to the normal standard set for the average child in our schools to-day, but allowing that the great majority of children over the country do strike a fair average as to age and grade, the issue may well be considered standardized and fairly settled as to the normal classification.

The function or aim of the segregation in our public school may be considered a social as well as an economic problem. The retarded child continues to meet failure in his regular grade and each successive attempt and failure only serves to close his mind to the work in hand. Eventually the child becomes a menace to the entire grade because of the increased amount of misdirected effort, and oftentimes it is the foundation for truancy and incorrigibility which we find so prevalent in the average school of to-day.

Regarding it as an economic problem. The child not only becomes a repeater, but without doubt causes the retardation of several others and handicaps the efficiency of both teacher and pupil thus multiplying the cost of himself and others. By segregating the child that is a failure in a grade we can oftentimes remove the obstacle which is causing the child to become a permanent defective.

Our method of determining the defective in the grade is by tabulating the school by grade and age. In this way the teacher and principal give an unbiased rating of the children under their supervision, and each child registering three or more years behind his appointed grade is examined by the revised Binet-Simon measuring scale for intelligence unless the retarded pupil is of foreign birth and recently entered the school. In my experience I have found the majority of children who have come under my

examination to test accurately and definitely in the Binet scale according to the child's actual experience in school. The evidence of retardation according to the Binet tests must be substantiated by actual failure in the class room experience. That is, a child registers chronologically between twelve and thirteen and we find him in the third grade doing fair to medium work. The Binet tests also rate him between eight and nine mentally, which is considered the normal standard for the third grade. The child is a misfit, is much overgrown, is a menace to a group of third grade children, and although he is not of the idiot or imbecile type, he is a sub-normal child and should be segregated. I believe eventually New York State will follow New Jersey in passing a law that special classes must be established for all children rating three years or more retarded, that they must be considered sub-normal until able to prove their efficiency.

It has been the custom in Rochester to establish a special class for sub-normals in the various districts where fifteen or more sub-normal children have been found in the school. Personally, I feel that there is little to discuss in the defense of such a plan, for as long as the child remains out of permanent custody he must come in contact with the various normal children in the neighborhood in which he lives, consequently he should not be transported to the other corner of the city where all special children are segregated and pointed out specifically as a member of the "Fool School," etc. The right special class teacher can adjust a class of sub-normals to a graded school in such a way as to make many normal children desire a seat in the special class and if she is not capable of establishing such an attitude she is the worst misfit in the class. The personality of the teacher must be particularly pleasing. The teacher with the most elaborate training will oftentimes fail utterly with a special group if she cannot meet their need socially. She must be a social worker in the broadest sense of the word. Filled with enthusiasm, unafraid of hard work, untiring in her efforts to reach into the home and be the friend in need.

By the above suggested method of segregation, the children are often found to come from the best homes as well as the poor-

est. Occasionally objections arise from the parents but usually the intelligent parent recognizes the need and is willing to allow the child to remain in the special class. In some instances where very pronounced cases have been placed regardless of the wishes of the parent, the child has won our case by being so satisfied and happy by the changed condition that he would not return to the grade. We have on our records only a few cases where the parents' opposition was so strenuous that the child has not been placed. There are no laws enforcing the transfer and much depends on the way the case is presented to parents by principal, teacher or director. Where a child is such a marked case that his attendance is impossible, we can under the law Relating to Attendance at School, exclude the child from school. The parent soon realizes after having the child at home twenty-four hours of the day, that he is quite as impossible as the school department has found him to be, and is willing to meet the issue to the child's best good.

At the present date we have organized eighteen classes for the sub-normals between the ages of seven and thirteen and a half, and seven classes for the advanced sub-normal children, whose need is best met with much emphasized industrial activities. In these twenty-five classes 382 sub-normal children are cared for, which constitutes about fifteen per cent. of the total number existing. Of the total enrollment of 277,421 excluding high schools and kindergartens, two per cent. are sub-normal.

The different classes at present established for these are as follows:

Backward classes	9
Truant classes	2
Foreign classes	11
Special sub-normal classes	18
Special vocational classes	3
Special shop classes	4

The boys are segregated into classes for larger industrial work at the age of thirteen and a half, and the girls into vocational classes especially fitted to meet their needs between thirteen

and sixteen years. The maximum enrollment in the special class is fifteen in order that each child may receive individual attention. Each child receives a careful medical examination and where parents are unable to rectify physical defects the children are taken to free clinics, hospitals, and dental dispensaries, where they are generous enough to meet their need.

A word of appreciation of our various philanthropic men and institutions cannot be amiss at this point. We have never been refused help and I earnestly believe that if physical rectifications could restore the child and eliminate retardation, our number believed to be sub-normal in Rochester would be nil. The children are placed in the class before the medical examination is made. We believe that if a physical defect has so handicapped a child that his efficiency in school has caused him to be a stumbling block, he should be removed from a regular grade until his physical defects are corrected and his mentality re-established if possible. The teachers are urged to consider each child as a savable case. If the subject in hand fails to awaken the child, we willingly resort to another method hoping against hope that we may find the avenue of approach and overcome the subnormality.

A special "gradation chart" is employed for each child. This chart gives a graph of the teacher's estimation of the child's work in each subject, regardless of any psychological age which is determined afterwards. Such a chart may show, for example, that a given child does work in reading and spelling equivalent to that of the first grade, arithmetic equivalent to that of the second grade, industrial training work equivalent to that of the fifth grade, etc. To the Binet examiner this gradation graph will serve as corroborative evidence of the age secured by the tests and will assist the teacher in determining in which subjects the child needs most help.

Concrete methods are used extensively and wherever possible the subject matter correlated with the nature work, reading, spelling, writing, painting, arithmetic and industrial work. Although the work in elementary subjects is minimized, each subject is given due time in the day's program and in cases where the child is more advanced in one subject than in another, his

need is met accordingly. In the industrial work of the special class for the younger children we offer bench work, basketry, sewing, knitting and weaving. Swedish gymnasium work is combined with games and rhythm work is one of the much emphasized activities. In the shop school manual training, shoe-repairing, furniture-mending, printing are the basis of work. Reading and arithmetic are minimized for often we find the big boy who is nearing the age of sixteen only capable of doing first grade reading and arithmetic. We cannot help but feel that if we develop a fair amount of an ability to stick to the business in hand we have not worked in vain for so often these boys eventually become the riff-raff element that fills our correctional institutions. The girls of like age present a formidable problem for even though they become equipped sufficiently to earn a living they as often become the victims of unscrupulous men and in the last analysis are an easy prey. In our vocational classes for sub-normal girls we aim to train the girls for acceptable servant girls and when they are determined to leave school for work at the age of 16 years, we attempt to place them in good homes and follow them to aid in keeping them out of factories and department stores. We are greatly in need of a director of "after school life and activities," one in charge of vocational guidance.

One of the gravest problems which confronts us is the inability of the average employer to adjust himself and understand the limitation of the submerged half.

Our problem of the number of defectives will never be lessened nor sufficiently recognized to remedy the cause until special classes are organized in the public school, throughout the country. They should not be considered as a remedial solution but only as a means to an end and until laws are made demanding the right to take into custody the defective child, the vast number will never be reduced either in insane asylums, almshouses, or prisons.

In the last analysis the public will have to choose between the care of the defective plus a crime, and the care of the insane, which many times is the outcome of wrong living on the part of those with weaker mentality, or the care of the mentally defective

child as he completes the work in the school or is taken from the school as unfit to have his own liberty.

It is my honest belief that an institution could be established for the mentally unfit which could be self-supporting through the various industries if put in the hands of the right man. Such an institution should not be compulsory but a place attractive enough to meet the needs of the inefficient and should be a preventive school rather than a correctional institution.

DISCUSSION

Dr. Goddard: Some members of the association who will remember that a year ago we had a discussion of the Binet tests, possibly may recollect that I stated at the time that I objected to certain statements in regard to them because I felt that they would interfere with the practical use that might be made of these tests in the public schools. I have been particularly interested in consequence, in this report of Miss Boehne's as showing that they are of practical value and I just want to point out in connection with her reference to Dr. Wallin's report that there are two uses of anything like the Binet tests—the purely scientific and the practical. I think if we could separate those two uses clearly in our minds it would save a great deal of possible heart-aches—at least time and discussion. Without question the greatest offenders in this respect are the psychologists. Psychologists want everything exact. The modern psychologist with his laboratory methods has no use for any guess-work, or any probabilities, or any likelihoods or anything of that sort. Everything must be brought down to dots. For instance, Dr. Wallin himself has said of these tests, in private, that every question ought to be given a numerical value of its own and then every answer to that question ought to be given a percentage value of the total and then an average summary made of all. Now the other side of the problem is the practical side and you all know—you gentlemen here who are medical men—just about how far you can get towards saving human life if you wait until you have absolute diagnosis right down to figures. There is the

practical side and the theoretical side, and the trouble with us today is that we are being annoyed by the psychologists who insist that we should not use these Binet tests unless they can be used with the mathematical certainty that counts up and spells one hundred per cent. of perfection every time. That is all right for the psychologist if he wants to use the tests in that way. If he wants to get at some psychological laws, let him use them as he likes and if he can't use them one way, let him try another, but for our purposes of getting something definite about the children in the public schools, something that is far more practical and more human and more valuable to society than anything that has ever been discovered, let the psychologist keep his hands off and let us use these tests as we find we can use them.

I am delighted that Miss Boehne has given us the practical side of it and has shown us that they can be used in exactly that way .

Dr. Neff: Mr. President, I would like to say a word about the destructive criticism. I had the pleasure of learning what little psychology I know from Dr. Seashore who is not only a psychologist but a sociologist and very much interested in the medical side of things, so that I think "psychology" is a very indefinite term. You get one kind of psychology in one place and some other kind in another place. It is an enormously scattered thing. I think that institutional people have to distinguish very sharply between the psychologist who goes to an institution to serve the institution and the psychologist who goes to the institution to exploit it. I think that we have two very definite sets of psychologists, hence the confusion. There are people that, when we say "psychologist" to them, will shrug their shoulders and be unwilling to admit that he has been of much use to medicine; but on the other hand, others recognize that he has been of practical service. I was talking to a man not long ago who, I think, is doing very good psychological work in an institution, and who has been criticized for trying to work out a different method of representing certain facts than the conventional one, and he felt very much hurt and discouraged about it. I quite agreed with him in his idea that the ultimate result of scientific work ought to

be simple, and unless it is simple, unless it is a thing the person of average intelligence can use, it is not of the highest value. The man who worked out the system of logarithms had a very difficult task but when it was completed it was so that any person could use it. It is the place, it seems to me, of the psychologist to develop the method and to correct it, but when it is completed, if he has done his work well, it ought to be a thing that any ordinarily intelligent person can get the value of and use.

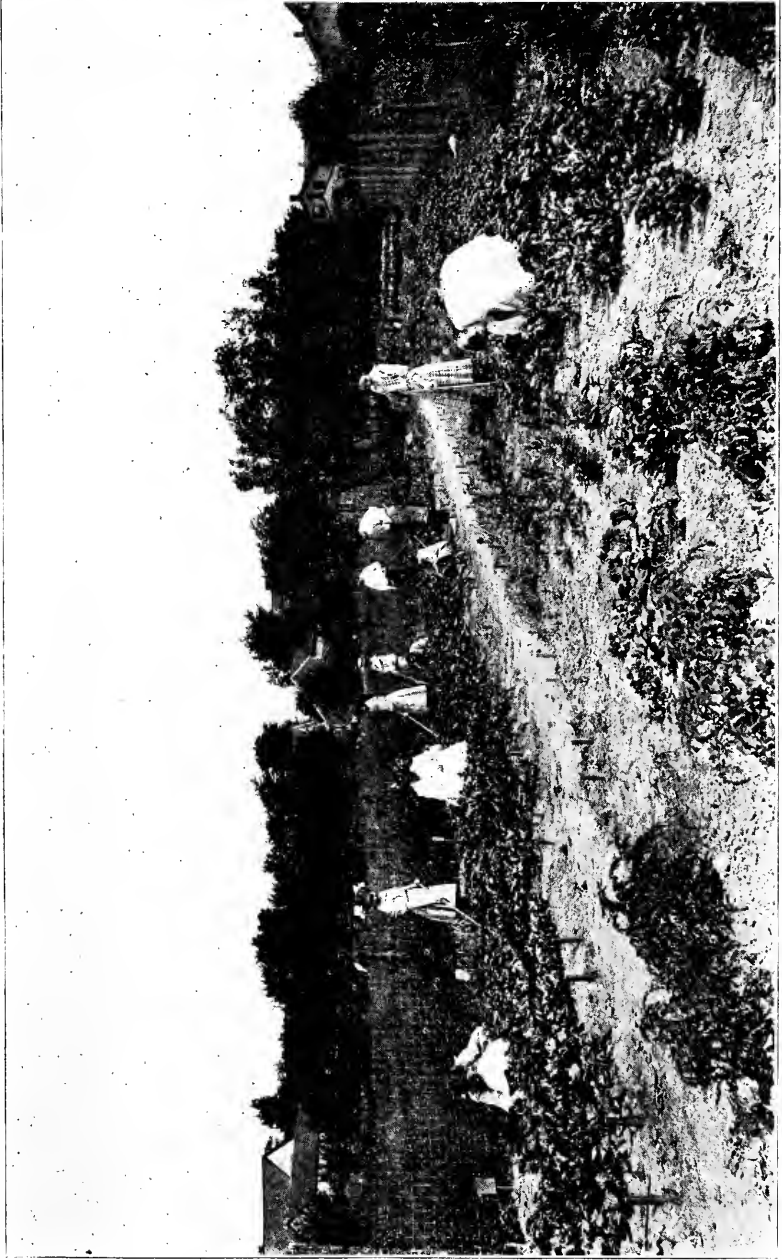
Dr. Town: Mr. President, I would like to say a word on that subject. It seems to me that if we follow out the dictum of Dr. Goddard and do not change the method when we use a system the psychologists have worked out, we must pay some attention to their directions. Binet-Simon, in every article they have written since 1905, have said very distinctly that their tests do not represent a mechanical system, and that the correlation will not hold good unless the test is given under certain conditions by a person who is able as he goes along to analyze the answers and mark his pluses and minuses according to his judgment.

I also want to say that I think Rochester is very fortunate indeed in having Miss Boehne to conduct these special classes.

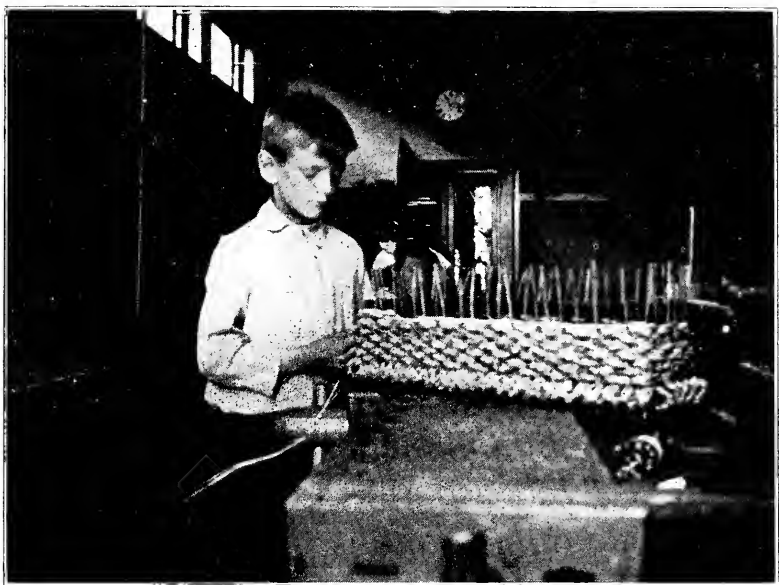
Dr. Fernald: I think that Dr. Goddard has impressed upon me the fact that the Binet test is a dignified psychological investigation and that to be of any value it must be conducted in accordance with the rules of the game. I have told this story: Perhaps you all have heard it but I like to tell it. During one of my busy days I had a number of patients to examine—I had worked all day and had no lunch. It was about five o'clock, I was tired and while I dislike to admit that I was cross, I probably was, and a social worker who had had a patient around all day insisted that I examine her. I protested but the social worker who had come a long distance felt that I had agreed to do so, and I did. I began with the Binet test. She graded about eight and a half or nine years of age. I said to the social worker, "It doesn't seem fair to settle that girl's future now"—for that was what the examination meant. It was a question whether she should be placed out on probation or sent to the reformatory or to a home for the feeble-minded, and I did not think it was quite

fair to the girl to leave the matter there. I told her if she would bring the girl back next morning I would give her another test. The next morning she appeared and when she saw me her eyes filled with tears and I felt very uncomfortable. I invited her into my office, where I have, as Miss Boehne has, a person who hypnotises my patients. She gave her some cocoa and cake and got her in a good frame of mind, and then I went in and chatted with her. I suggested that we take up those questions again and she sailed through them like a bird. You see the night before I had tested my own mental condition, not the girl's.

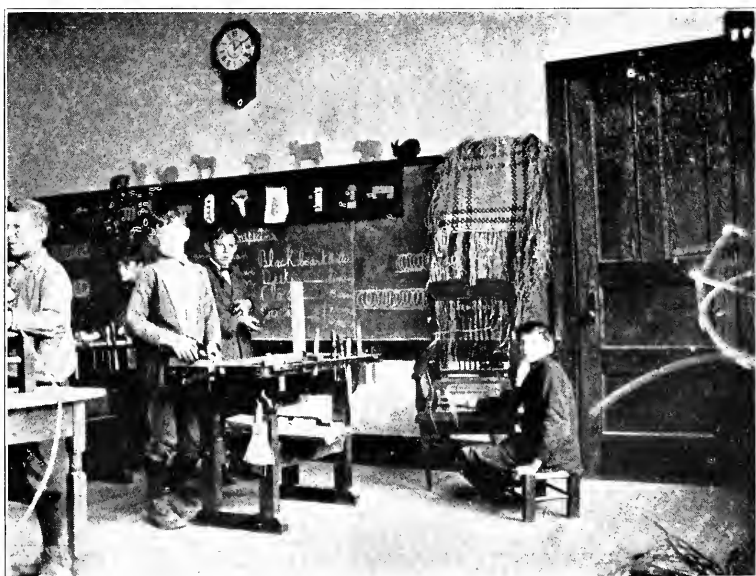
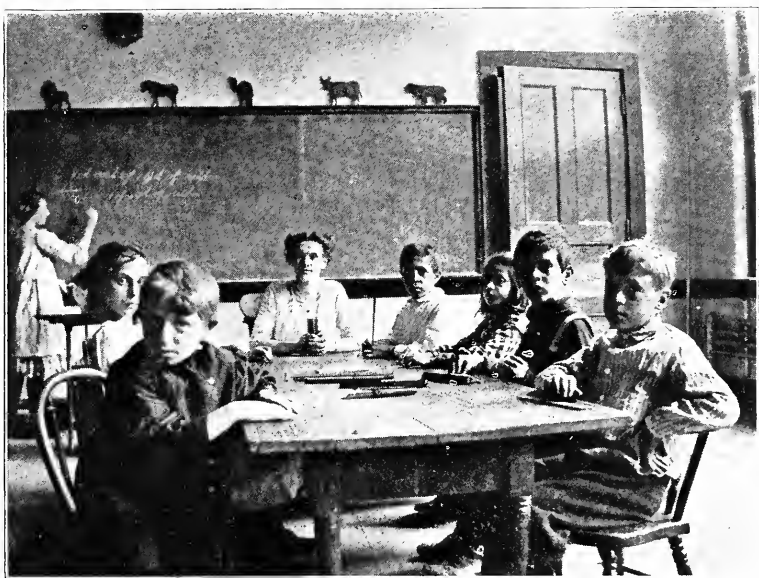
Dr. Wallace: I was tremendously interested in Miss Boehne's practical psychology. Is not Miss Boehne putting the entering wedge into the public school system that is going to rejuvenate it? Is it not going to be a practical thing all over the country? Is she not opening up an avenue whereby children do not have to range within certain narrow channels in order to be considered normal? I have in mind, just at this moment, two women who are sisters. One of them after struggling with the present school system got along to about the fifth grade. She, of course, had many heartaches and discouragements that go with being backward in school. Her sister never got beyond the eighth grade although she stayed in school until she was seventeen or eighteen years old. The first sister I mentioned is now a trained nurse in Boston receiving from twenty-five to thirty dollars a week and much sought after by the leaders in the profession there. The other girl is bookkeeper in one of the mercantile houses and is paid twenty-five dollars a week.



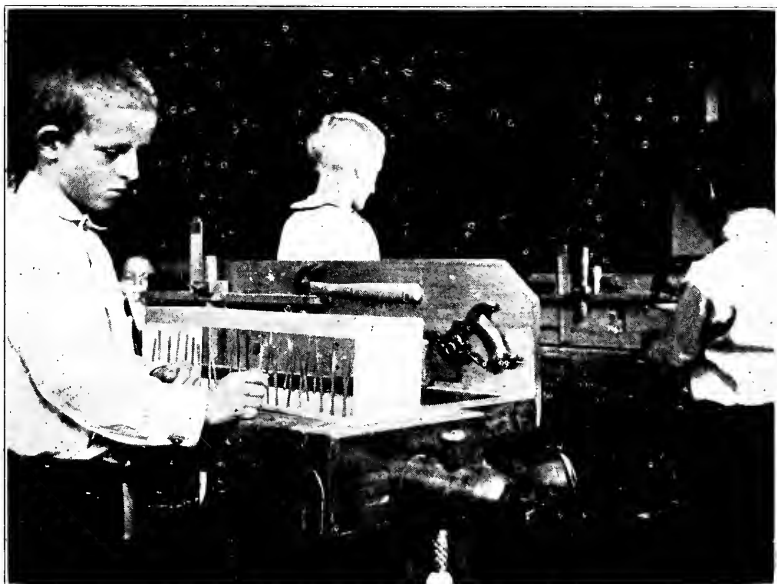
Employment—Rochester Special Classes (N. Y.)



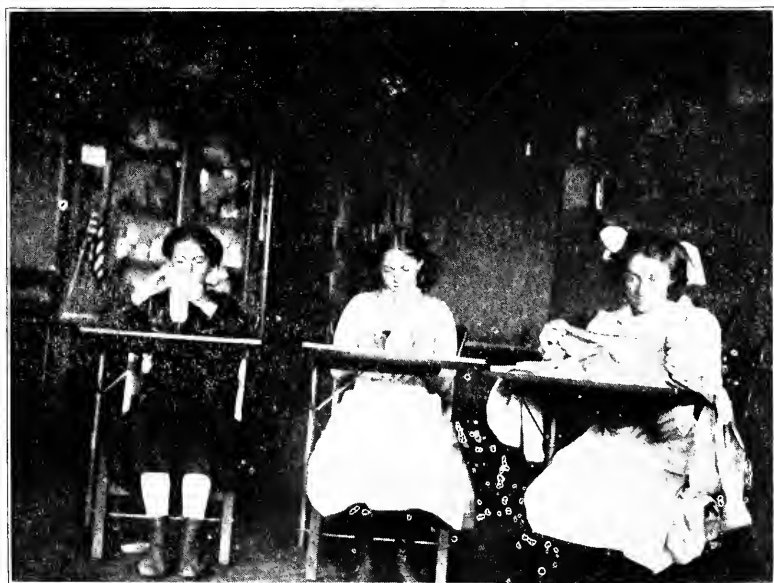
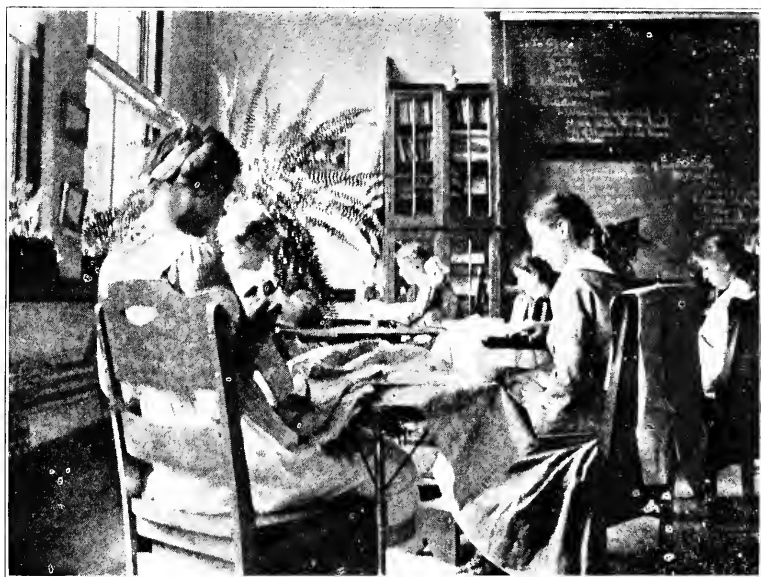
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Employment--Rochester Special Classes (N. Y.)

A NOTE ON THE VALUE OF SENSORY GYMNASTICS

BY E. A. FARRINGTON, M. D., *Bancroft Training School, Haddonfield, N. J.*

We are accustomed to associate the term gymnastics with motor exercises employed usually for the purpose of improving general nutrition and of developing muscular strength and endurance, although none would deny that the motor nerve paths, ganglia and cortical areas are also developed and improved. But exercise of the sense organs in the form of routine drill of sensory functions, having a similar developmental end in view, is rarely practiced.

This is doubtless because sensation is commonly regarded as a faculty rather than a function, and its physiologic relationships are thus in large measure ignored. But if the motor mechanism of the body obeys the law of development from use, the sensory mechanism can be no exception to it. Physical exercise of the sense organs and related structures must—at least theoretically—result in development both of structure and of function. That this holds good in practice may be demonstrated in the training of mentally subnormal children. Edward Seguin recognized its truth many years ago and since that time numerous schools have utilized his methods. These methods have been applied chiefly in schools for the subnormal. Teachers of normal children have paid but little attention to sensory drill—except in its psychologic aspects—and it is only during the past year that they have been awakened to the value of treating sense organs as physiologic structures, by the wide discussion given to this phase of the Montessori system of scientific pedagogy. It is interesting to note in passing, that Madam Montessori began her work among mentally subnormal children, using Seguin's classic work on physiologic education* as her textbook and guide.

During the past four years the writer has had an opportunity

*Idiocy and its Treatment by the Physiological Method. EDWARD SEGUIN, M. D., N. Y., 1866.

to work out and study the effect of a series of sensory gymnastics considerably more complete in its content and more regular in its application than is usually found elsewhere. The following brief description of the exercise will give a general idea of the method used: Each sense was drilled separately, precautions being taken to exclude as far as possible extraneous sensory impressions and associated ideas so that the results might be safely measured. The fact that the primary purpose of the exercises was to develop the physical structures rather than to teach something by means of the senses was always kept in mind. A half hour was devoted to the drill daily, five days per week and approximately forty-five weeks per year. One child was drilled at a time and one, two or perhaps three senses exercised during the half-hour period. The complete series was composed of separate drills for visual, auditory, olfactory, gustatory, tactile (i. e. pressure) baric, thermic and stereognostic senses. In exercising the visual sense the aim was to develop speed and accuracy in the recognition of form, color and arrangement. For this purpose the objects selected were a sphere, a cube, a cylinder, a square pyramid and a cone. These objects were of good size (three inches in the smallest dimension) and a complete set was provided in each of the colors, white, red, green blue, and yellow. As a background upon which to place the objects a thirty-inch square of dull black felt was used. Geometric forms were selected in preference to commoner objects because of their almost entire lack of associational relations in the child's mind.

In the first exercise a white sphere was placed upon the square of black felt, hidden beneath an appropriate cover. The pupil was seated about thirty inches from the object and was required to name the object after it had been uncovered a short time and then re-covered. The other forms were treated in like manner, the period of exposure being shortened as the pupil became familiar with the exercise. Later the color of the objects was varied and several models were used in a group, the order of their arrangement being changed. When these exercises were readily performed, correlation with familiar objects was introduced and similar exercises with other objects added but the

earlier drill was not abandoned because it was familiar to the child any more than a pupil in the gymnasium would be required to abandon dumb-bell or wand exercise because he had learned to do them well.

In training the color-sense the hypothesis of Hering was adopted as a provisional basis for the exercise, this being the theory that seemed to come nearest to covering the facts. The accuracy of some of Hering's conclusions may be disputed but pragmatically regarded his general theory seems true; at least its practical application certainly appears to attain results. Hering's three chromochemical substances were accordingly made the basis of the color-drill and the exercises were planned to develop their quantity, activity and distribution. The color-pairs, green-red, blue-yellow and black-white were used at first separately, the anabolic and catabolic colors being alternated. Later they were used in combination and the training carried on to a series of carefully graded exercises in the recognition of the six fundamental spectral colors (omitting indigo) and the differentiation of their respective hues, tints and shades. The old color theory of Brewster was discarded as having no direct physiological significance.

The auditory sense was drilled by systematizing various sounds. Different instruments such as the bell, rattle, horn, drum, triangle, etc., were selected. The child was first taught to make the sounds himself. He was next required to listen while a sound was repeated without his being able to see the source and he was then to indicate upon which instrument among many upon the table the sound had been made. Many exercises of this general type were utilized, the chief points aimed at in the training being the accurate recognition of quality, intensity and pitch. Later, exercises in more complex tone differentiation were introduced with the aid of the phonograph.

In the gustatory drill the six fundamentals, sweet, bitter, sour, salt, metallic and alkaline were first exercised. These were followed by a large number of stimuli, non-volatile substances being selected to avoid as far as possible the detection of the substance by simple olfaction. The child was of course blindfolded

during the drill, automobile goggles with opaque glasses being used.

The olfactory exercises were made up of familiar recognition tests, using about twenty-five essential oils and other volatile substances.

Pressure sense was at first exercised by drill in the recognition of such differences in surface conditions as rough, smooth, hard, soft, elastic, etc. The exercises were performed by introducing two or more objects into a small cloth bag and requiring the child to insert one hand and select, by means of tactile sense only, a rough or smooth or hard object as the case might be. The objects were of course alike in every respect except the particular quality to be studied. The later drills passed gradually through the recognition of raw cotton, silk, wool, hair, fur, etc., to the differentiation of cotton, woolen, linen and silk fabrics of various kinds.

The apparatus for the exercise of the thermic sense consisted of eight white enamel pint cups. These vessels were filled with water of differing temperature. Two cups were used at first, one containing hot water, the other cold. When these had been made familiar a third or lukewarm cup was introduced and finally cups were filled in pairs and the child required to group them according to temperature, the complexity of the exercise being gradually increased. The possibility of the pupil recognizing the difference in the vessels by their appearance, position or the amount of water in them was guarded against, so that temperature sense would be the only sense available and the right and left hands were of course drilled alternately.

In training the baric, or muscle sense, the first exercise consisted in grouping the objects of the same weight in pairs. The objects used were four-inch white cubes, paired with square pyramids, varying in weight from one to two pounds. Numerous other exercises involving muscle and tendon tension were employed and the relation of pressure sense was brought out by drill in the differentiation of the weight of objects placed upon the upturned palm, the back of the hand resting upon the table. For training extensive muscle groups a number of covered baskets.

alike in every respect, were loaded with pebbles through a wide range of weights and selective exercises utilized.

Stereognostic sense was drilled by placing in a cloth bag three or four small geometric forms such as the sphere, cube, cylinder, etc. The pupil was required to recognize these forms by introducing the hand into the bag and examining the objects with the fingers, withdrawing a designated form on command. Later, other objects of increasing complexity were used, care being taken to avoid involving pressure sense.

A complete analysis of the effect of this training upon the pupils who received it regularly would require a volume. It can be said in general, however, that there was a marked improvement in sensory activity. The result of the color-training in one case was especially interesting. This pupil was affected with color-blindness of the green-blind type. The blindness was only partial but the retinal color fields were much reduced. After eight months of regular exercise of the chromochemical substances, especially of the green-red substance, an increase in the size of the color fields was observed. They decreased somewhat upon cessation of the exercise but after a lapse of three months there was still a noticeable improvement in color vision.

In addition to sensory development certain definite results in the school work were traced to the sensory drill. Perhaps the most notable among these was the improvement in the work in language as shown in broadened associations, more accurate memory for words and clearer and more logically expressed ideas. Even the handwriting improved. The effect of the auditory exercises upon work in music was unmistakable. Manual occupations were benefitted in a number of ways. In fact there seemed to be a general increase in the efficiency of the pupils' entire intellectual equipment.

One of the chief objections made to sensory exercises of this sort is that the labor involved and the patience required are not justified by the results. Our observations have tended to show that this is not a valid objection. It is perhaps a matter of opinion as to how great a result must be gained to constitute a justification of the method, but at least our comparisons demonstrated

that sensory gymnastics are superior to purely psychologic sense-training. Madam Montessori, whose name has recently become familiar to us all, touched the real keynote of the matter in the second chapter of the book, on pedagogy (*) where she said:

"I felt that I understood the discouragement of those working with feeble-minded children, and could see why they had in so many cases abandoned the method (of Seguin). The prejudice that the educator must place himself on a level with the one to be educated sinks the teacher of deficient into a species of apathy. He accepts the fact that he is educating an inferior personality and for that very reason he does not succeed..... Instead of all this we must know how to call to the **man** which lies dormant within the soul of the child. I felt this intuitively and believed that not the didactic material but my voice which called to them, **awakened** the children.....I was guided in my work by the deep respect which I felt for their misfortune and the love which these unhappy children know how to awaken in those who are near them."

*The Montessori Method of Scientific Pedagogy. MARIA MONTESSORI. Translated by ANNE E. GEORGE, N. Y., 1912, p. 36.

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DEATH OF PRESIDENT CARROLL

It becomes the painful duty of the Journal to record the death of A. E. Carroll, the newly elected President of the Association. Mr. Carroll passed away on the evening of August 27, after a few days' illness from pneumonia, at the Indiana School for Feeble-Minded Youth, Fort Wayne, of which he was Superintendent.

MINUTES OF THE ASSOCIATION

The thirty-sixth annual session of the American Association for the Study of the Feeble-Minded was held in Garrison Hall, New Jersey Training School, at Vineland, June 4, 1912. The meeting was called to order by President H. G. Hardt at 10:30 a. m.

Secretary Rogers announced the President's annual address as the first proceeding on the program. After the address, Dr. W. S. Cornell, director of medical inspection of the schools of Philadelphia, read his paper entitled, Report on Medical Research. Discussion of the paper followed.

President Hardt then announced that the next number, not down on the program, would be an address on The Application of Biochemistry to the Problems of Psychopathology, by Dr. Amos W. Peters, of the Nutrition Laboratory of Boston. Secretary Rogers stated that as many questions had been presented in regard to the work which Dr. Peters proposes, he had asked Dr. Goddard to explain it as an introduction to the paper.

Dr. Goddard said: I will just say that almost from the beginning we have felt the necessity for biochemical work in connection with our studies, because we feel that we do not know about these children until we know the chemistry of their metabolism. We found a beneficent friend who was willing to help us financially and enable us to extend our work in this way. We have started by the appointment of Dr. Peters as Biochemist to operate in connection with our research work, and he will tell us what the problem is as he sees it.

Discussion of this paper was postponed until after luncheon which was served in the Training School dining-room at 12:30 p. m.

The first business transacted at the afternoon session which convened at 2:30 p. m. was the appointment of committees by the chair, as follows: Committee on Time and Place, Drs. Keating, Wallace, and Shanahan; on organization, Dr. Fernald, Mr.

Johnstone, Drs. Smith, Mogridge, and Emerick; on audit, Mr. Carroll and Dr. Kutnewsky.

The paper read by Dr. Peters in the forenoon was then discussed after which Dr. Walter E. Fernald read his paper, *Defective Delinquents*. Dr. Clara Harrison Town, of Lincoln, Ill., followed with a paper, on the Study of Speech Development in Two Hundred Eighty-five Cases. At the conclusion of the discussion on this paper, the session adjourned until 9 a. m., June 5.

The meeting on the second day was held at the gymnasium of the State Institution for the Care and Training of Feeble-Minded Women, President Hardt in the chair. He announced the election of new members as the first order of business and then called on Dr. Elise Gordon, of Cranbury, N. J., to read her paper, *Use of Electricity in Chorea*. After this paper had been read, Dr. Gordon requested the privilege of reading another, a short one giving a few brief case histories. This was granted and at the conclusion of the reading discussion of Dr. Gordon's first paper was taken up.

President Hardt then announced that the paper sent by Dr. Dawson, of California, *Preliminary Report on Wasserman Test*, would be read by title, the Doctor being unable to be present.

Miss Grace Boehne, of Rochester, N. Y., read the next paper, *Regarding Special Classes for Sub-Normal Children*. Discussion of the paper was postponed on a motion by Secretary Rogers to adjourn, explaining that Dr. Hallowell had arranged for those who wished to look about the institution to do so at this time and afterward to have luncheon with her at 12:30 p. m. The motion was carried and the meeting adjourned.

At the afternoon session, in the same place, vice-president A. E. Carroll occupied the chair and the first proceeding was an address by Dr. H. H. Goddard on *Mental Improvement of Institutional Cases*, followed by discussion.

Miss Kite was next heard on *Field Work* and when she had finished Mr. Carroll said that he could "now understand why

Miss Kite does not have any trouble in getting the information she desires."

Discussion on Dr. Town's paper, A. Study of Speech Development in Two Hundred Eighty-five Cases, read the day before, then took place after which reports of committees were ordered by Mr. Carroll.

Dr. Goddard: As chairman of the Committee on Time and Place, I wish to state that we have a tentative invitation from Dr. Haynes to go to Lapeer, Michigan, and while he informed the committee that he wished to invite them there next year he wanted to get that confirmed by his board. The board will meet on the thirteenth of this month and he will let us know by the fifteenth, and unless there is some obstacle we recommend that the association meet at Lapeer next year. Of course, if the board will not let him have the meeting there, we will have to confer with the secretary and if we have an invitation to some other institution we will have to decide. Therefore I can only report progress.

Dr. Rogers: I move that the Committee on Time and Place be continued to report to the Executive Committee when they are ready to make report. Carried.

Mr. Carroll: The Committee on Organization?

Dr. Fernald: Mr. Chairman, the Committee on Organization would report the following nominations: For president, Mr. Carroll, of Indiana; for Vice President, Dr. Kutnewsky, of North Dakota; for Secretary and Treasurer, Dr. Rogers, and for editors of the Journal, the present staff.

A member: Mr. President, I move the adoption of the report of the committee.

Dr. Rogers: Mr. Chairman, before that report is adopted, I would like to add the name of Dr. Fred Kuhlmann to the staff.

Dr. Murdoch: I move that that name be added to the list.

Mr. Carroll: That will be taken by consent if there is no objection. You have heard the motion with reference to the recommendation of the Committee on Organization. All those in favor of the same will signify it by saying aye. Contrary, no. It is so ordered.

Dr. Rogers: I have the report of the Treasurer, Mr. Chairman, if you wish to hear it. The Auditing Committee, Dr. Bliss, Mr. Carroll and Dr. Kutnewsky have signed and approved the report.

The report was then read.

Mr. Carroll: There is nothing further to come before the Association this afternoon and we will adjourn to Dr. Goddard's Laboratory.

Professor Johnstone: Mr. Chairman, are not the nominations for new members to come at this time?

Secretary Rogers: Mr. Chairman, I have three names to present, viz., Dr. H. A. Haynes, Lapeer, Michigan; Dr. Murdoch Bannister, Ottumwa, Iowa, and Mrs. Cora Bristol-Nelson Murfreesboro, Tenn. These were elected to active membership.

Dr. Murdoch: Mr. Chairman, this is probably the last formal gathering of the association. As a member of the Resolutions Committee, I wish to call to mind what is noted by all those members who have been attending these meetings for some time, that there is absent today our fellow members, Drs. Beaton and Carson. These men not being among us for their able counsel, be it resolved, therefore, that a message of greeting be sent from this, the thirty-sixth annual session, and further, Mr. Chairman, we have had here a most delightful gathering and have been royally entertained in these lovely surroundings, the ideal meeting place for an association such as this, a splendid atmosphere in every respect. The fine work we have seen here about us has been an inspiration to us all. We have learned much. We have been splendidly entertained and we have all had a splendid, good time, so that we further recommend this resolution:

Be it Resolved, That a motion of thanks be extended to Professor Johnstone and Dr. Hallowell, to Dr. and Mrs. Goddard and to Mr. and Mrs. Nash and to all the good people connected with the New Jersey State Institution for Feeble-Minded Women and the New Jersey Training School for Boys and Girls, not forgetting the children, who have so splendidly and ably ministered to our pleasure and comfort; and further, I miss here the presence of my dear friend, the wife of our good friend Johnstone. We

are pleased to hear of her recovering health and we wish her joy and happiness and speedy restoration to her normal condition of health.

Dr. Keating: I second the resolution.

Mr. Carroll: All those who are in favor of the same will signify it by rising to their feet. It is unanimous.

Dr. Rogers: I have presented here by Dr. Goddard, the following names for membership, viz., Dr. Hardy of N. C.; Dr. Amos W. Peters, Vineland, N. J.; Dr. W. C. Herriman, Orillia, Ont.; Dr. O. H. Cobb, Syracuse, N. Y.; Dr. Clara Harrison Town, Lincoln, Ill.; Miss Mattice, Orange, N. J.; Dr. Samuel B. Hickman, New York City.

Professor Johnstone: I should like to offer the name of Mr. J. T. Maston, Secretary of the State Board of Charities of Virginia for associate membership.

Mr. Carroll: Are there any further nominations?

Dr. Weeks: I would like to nominate Mr. Joseph P. Byers, Commissioner of Charities and Corrections of this state.

Mr. Carroll: Are there and further nominations?

Dr. Rogers: Mr. Chairman, I second the nominations of the respective gentlemen for membership.

Mr. Carroll: You have heard the nominations as made and seconded. Are you ready for the question? All those in favor of same will signify by saying aye. Contrary, no. It is unanimous. We will now report to Dr. Goddard's sanctum for his laboratory program.

Adjourned.

The following persons were in attendance:

Anderson, Miss Meta L.,
Newark, N. J.

Andrews, Dr. B. F., Sonyea, N. Y.

Bannister, Dr. and Mrs.,
Glenwood, Iowa.

Benson, Dr. Harry W.,
Oakland, Nebraska.

Bernstein, Dr. and Mrs. Chas.,
Rome, N. Y.

Bliss, Dr. Geo. L.,
West Pownal, Maine.

Boehne, Miss Grace M.,
Rochester, N. Y.

Boyd, Dr. Wm. A., Westport, Conn.

Brockway, Dr. Porter B.,
Toledo, Ohio.

Byers, Hon. Joseph P.,
Trenton, N. J.

Carey, Dr. H. M., Spring City, Penn.

Carroll, Mr. A. E., Fort Wayne, Ind.

Cobb, Dr. C. H., Syracuse, N. Y.

Cornell, Dr. Walter S.,
Philadelphia, Penn.

Dew, Dr., Madison Heights, Va.

Douglass, Miss Mary I., Rome, N. Y.
Douglass, Mr. James A., Rome, N. Y.
Downing, Dr. Bertha C., Worcester, Mass.
Emerick, Dr. and Mrs. E. J., Columbus, Ohio.
Ennett, Dr. N. Thomas, Richmond, Va.
Farrington, Dr. E. A., Haddonfield, N. J.
Fernald, Dr. Walter E., Waverley, Mass.
Frost, Dr. Carrie, Chippewa Falls, Wis.
Goddard, Dr. and Mrs. H. H., Vineland, N. J.
Gordon, Dr. Elise, Cranbury, N. J.
Gundry, Miss Mattie, Falls Church, Va.
Hallowell, Dr. Madeleine A., Vineland, N. J.
Haigler, Dr. F. H., Skillman, N. J.
Hardt, Dr. H. G., Lincoln, Ill.
Hardy, Dr. and Mrs. Ira M., Kinston, N. C.
Herriman, Dr. W. C., Orillia, Ont.
Herring, Dr. J. W., Owings Mills, Md.
Haynes, Dr. H. A., Lapeer, Mich.
Jackson, Miss, Falls Church, Va.
Johnstone, Mr. E. R., Vineland, N. J.
Katzen-Ellenbogen, Dr. Edwin, Skillman, N. J.
Keating, Dr. Frank W., Owings Mills, Md.
Kelsey, Dr. Carl, Philadelphia, Penn.
King, Miss Fanny, Orange, N. J.
Kutnewsky, Dr. J. K., Redfield, S. Dak.
Lattimore, Miss Florence, New York City.
Little, Dr. and Mrs. C. S., Thiells, N. Y.
Loos, Miss, Bala, Penn.
McGrew, Miss Anna L., Bala, Penn.
Mahady, Dr. Charles R., Rome, N. Y.
Makuen, Dr. G. Hudson, Philadelphia, Penn.
Mastin, Mr. Joseph T., Richmond, Va.
Mattice, Miss, Orange, N. J.
Mogridge, Dr. Geo., Glenwood, Iowa.
Moosbrugger, Mr. and Mrs. H. F., Skillman, N. J.
Murdoch, Dr. and Mrs. J. M., Polk, Penn.
Munson, Dr. J. F., Sonyea, N. J.
Nash, Mr. and Mrs. C. E., Vineland, N. J.
Neaffie, Miss Harriet, Rochester, N. Y.
Neff, Dr. Mary Lawson, Boston, Mass.
Nelson, Mrs. Cora Bristol, Murfreesboro, Tenn.
Nelson, Mr., Murfreesboro, Tenn.
Nevin, Dr. and Mrs. E. A., Newark, N. Y.
Patterson, Dr. Louise, Vineland, N. J.
Patterson, Miss Harriet W., Laconia, N. H.
Nusbaum, Mr. Louis, Philadelphia, Penn.
Perry, Dr. M. L., Parsons, Kans.
Peters, Dr. Amos W., Vineland, N. J.
Powell, Dr. Velura E., Red Oak, Iowa.
Priddy, Dr. A. S., Madison Heights, Va.
Reed, Mrs. Frank A., Detroit, Mich.
Richards, Miss Alice B., Laconia, N. H.
Rogers, Dr. A. C., Faribault, Minn.
Ross, Dr. Donald L., Mansfield Depot, Conn.
Seguin, Mrs. Elsie M., Orange, N. J.
Shanahan, Dr. W. T., Sonyea, N. Y.
Severance, Dr. Cyrus J., Rome, N. Y.
Smith, Dr. and Mrs. W. H. C., Godfrey, Ill.
Smith, Miss, Detroit, Mich.
Stonaker, Mr. C. L., Newark, N. J.
Stump, General and Mrs. Herman, Owings Mills, Md.
Sullivan, Miss Anna E., Washington, D. C.
Spangler, Dr. Ralph, Philadelphia, Penn.
Taylor, Miss Mabel A., Rochester, N. Y.
Town, Dr. Clara H., Lincoln, Ill.
Van Wagenen, Mr. Bleecker, Vineland, N. J.
Von Poswik, Dr., Skillman, N. J.
Wallace, Dr. Geo. L., Wrentham, Mass.
Weeks, Dr. and Mrs. David F., Skillman, N. J.
Winterode, Dr., Owings Mills, Md.
Wylie, Dr. A. R. T., Grafton, N. Dak.

TREASURER'S REPORT—1911-1912.

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REVIEWS AND NOTICES

The Conservation of the Child. A Manual of Clinical Psychology Presenting the Examination and Treatment of Backward Children. ARTHUR HOLMES. *Assistant director of the psychological clinic; assistant professor of psychology, University of Pennsylvania. Philadelphia and London. J. B. Lippincott Company, 1912. Pp. 1-345.*

The psychological clinic at the University of Pennsylvania was begun by professor L. Witmer a number of years ago. Under his direction it has rapidly passed the experimental stage and has become an organization of far-reaching influence. This book by Dr. Holmes describes in a most practical and intelligent way the purposes and the methods of the clinic as conducted at the University of Pennsylvania. To those unfamiliar with the rapid developments in this field during the last few years the book will be a revelation. To psycho-clinicians it should prove a most helpful contribution. The following chapter headings indicate its scope:

1. Historical sketch.
2. Constitution of the clinic.
3. The function and the field of the psychological clinic.
4. Operation of the clinic.
5. Classification of clinic cases.
- 6-7. Methods of classifying clinic cases.
8. Classification of moral deviates.
9. Sociological relations of the clinic.

After the historical sketch on the care and training of mental defectives in institutions, in special classes for defectives in the public schools, and of the more recent application of psychology to the general problem, he describes the necessary equipment of rooms, apparatus, clinic staff, the qualifications and duties of its members. The purpose and function of the clinic is not merely that of a laboratory to get scientific facts, nor that of a training school to give pedagogical advice. It is both. It is "to restore the special child to normality or as near to normality as possible." Among the tasks of the clinic are: "Collection and filing of data; the development of the best clinical tests for measuring the mentality of children; the training of teachers and social workers for service among mental defectives; the diagnosis of mental diseases; and the most expeditious and satisfactory methods of connecting backward children with the proper sources of aid for relieving or ameliorating their condition." In the fourth chapter a general description is given of the procedure in the several examinations made of the child. These examinations are four in number.

1. Oral examination, made by the psychologist, inquiring into the pedagogical and family history of the child.
2. Physical examination, made by the physician, including anthropometric measurements.
3. Mental examination, made by the psychologist, including general observations on the child while in the clinic, a set of simple tests, such as the Binet-Simon tests, and more elaborate laboratory tests, when necessary.
4. Social, made by the social worker, including arrangements for visits to the home, and advice to parents after such visits. Defective children

are classified first into two large groups, mental deviates, and moral deviates. Mental deviates are sub-divided into curable and incurable. The incurable are the feeble-minded as illustrated in the institutional case. The curable are again sub-divided into three classes according to the time required to restore them to a relatively normal condition. In this classification the practical point of view of prognosis is strongly emphasized. "A mental diagnosis is essentially a prognosis." "The essential quality to be sought in a mental classification is not the child's mental attainments, nor his present mental capacity, but his present mental potentialities." This prognosis, he thinks, is usually indicated by the results obtainable in the examinations. A good third of the book is devoted to the "methods of classifying clinic cases," in which the procedure in the several examinations is described in detail. It includes lists of questions and outlines for inquiry into the (1) pedagogical history; (2) past medical history; (3) family history; (4) personal capacities; (5) social capacities; (6) moral capacities; (7) industrial capacities; (8) anthropometric measurements; (9) dynamic measurements; (10) medical examination; (11) pedagogical tests; (12) the Binet-Simon tests; (13) special tests for mental analysis. The special features of this rather elaborate program are the pedagogical tests, and the special tests of mental analysis. The former are on the order of school examination questions, standardized for each grade from the second to the fifth grade, inclusive. The latter are laboratory tests on (1) sensation and perception, a group for each sense department; (2) reproductive memory; (3) apperception; (4) volitional motor ability. Directions for each individual test are given. They require considerable apparatus, involve a good deal of technique, and are intended to be given by a well trained psychologist only. Their purpose is to "decide fully upon any doubtful case or to locate peculiar mental disturbances. It is, in a sense, a court of last appeal, and at the same time an instrument of searching clinic exactness which requires for its application an experienced examiner and a psychological laboratory equipped with a full quota of scientific apparatus."

In discussing the classification of moral deviates two questions are raised for the clinician: "What is moral imbecility?" and "How shall it be diagnosed?" The history of opinion is reviewed in regard to the former question. Among the conclusions arrived at are the following: (1) Moral imbecility may exist in conjunction with or without intellectual defect. (2) It may be either congenital or developmental, but the bad conduct is an habitual expression of character, not occasional or exceptional. (3) The bad conduct may be due to lack of moral sense, of social instincts, or of reason. (4) The true moral imbecile is incurable, his character is irreformable, and his conduct unchangeable. The problem of the clinician is to determine whether any particular case is curable, whether he can be restrained in any way from bad conduct in the future. This question, however, cannot be decided from the symptom complex alone. A boy may be guilty of any or several crimes and yet come to live a moral life later. Nor does a study of physical characteristics and facts about heredity help to decide in the individual case. The

examination of the moral deviate follows the same lines as in the case of the intellectual deviate. The reader is left to conclude that the clinician will be able to diagnose the curability or incurability of the moral deviate from the combined results of these several lines of inquiry already outlined for the mental deviate. The closing chapter on the sociological relations of the clinician discusses the different strata of society from which the cases come, the classification into curable and incurable, together with modes of procedure in dealing with them.

The book is a timely one and cannot fail to receive an extensive and hearty welcome. It makes no apologies for the existence and claims of the psychological clinic, and it does more than any other publication that has so far appeared to show that none are necessary. There are a few instances in which the author seems to go too far, or at least leaves the impression that the clinic can accomplish things where the same has not as yet been sufficiently demonstrated. (1) Certain chapters give the impression that a large share of the retarded pupils in the public schools can be brought up to normal or nearly so; they are curable. The reviewer knows of no evidence to indicate that this is so for more than a rather small minority, except in cases where the retardation is merely pedagogical. The value of an accurate diagnosis as to mental development lies not so much in the curability of the defect when recognized as in adapting treatment and training to the needs and capacities of the case, irrespective of the future mentality. (2) There are surely many cases in which a correct diagnosis does not indicate the prognosis. Prognosis requires an accurate knowledge of the nature of the causes of the mental deficiency, and this is in very many cases not obtainable in a measure required for a reasonably well founded prediction as to the outcome of the case. (3) The special tests described for use of mental diagnosis in cases that remain doubtful from the results of the usual tests are of no great value to any one who has no norms for them, and no norms are given by the author. We can draw no conclusion from the results of these in any given case when we do not know what results we would get with the tests on normal children. (4) In discussing the normal deviate the problem set the clinician is again to determine whether a given case is curable or incurable. The author fails to make clear how this can be done with the methods described.

Faribault, Minnesota.

F. KUHLMANN.

Ueber Hirnrindenveraenderung bei Mongolismus, Kretinismus und Myxoedem. W. WEYGANDT. *Zeitschrift fuer die Erforschung und Behandlung des jugendlichen Schwachsinn auf wissenschaftliches Grundlage. Fuenfter Band, 1912. Pp. 429-454.*

Weygandt reports on the findings on the brain changes in three cases of Mongolianism, one case of endemic Cretinism, and one case of Myxoedema. Two of the Mongolian cases died at the age of ten years, the first of diphtheria, the second of scarlet fever. The third Mongolian case died at the

age of twelve years of tuberculosis. The other cases were both apparently adults. He gives a brief clinical history of the third case of Mongolianism, and of the case of Cretinism and of Myxoedema. The microscopic study in all cases seems to have been limited to a few sections taken from the frontal and occipital lobes. In general, the findings do not indicate anything characteristic of these types of cases. In the three Mongolian cases the tangential fibres were more markedly absent than the radial. The association groups are not mentioned. In all three cases the cells show the embryonic type of structure, the first case about like that of a seventh month foetus, except that the cells are arranged more in groups and layers. In the other two Mongolian cases the general cell development was a little more advanced. The clinical description of the third case indicates a mental development of at least several years. In the first case the Nissl bodies show fairly well in some parts. In other parts they are small to granular. With Nissl staining the nucleus stains little, the processes show poorly. Elements suggesting neuroblasts are numerous. In the second Mongolian case the cell changes were similar, except that many cells showed two nuclei or nuclei with two bodies. Some are granulated towards the point and base. Some are swollen, but the vessels show no changes. The characteristic of the changes in the third case in distinction from the other two is a predominance of secondary changes—sclerosis, swelling, and fatty deposits. The sections suggest cells that were arrested and then changed further through secondary disease. The Cretin had an intelligence of about that of a normal child of one to two years. The gross brain development showed nothing special. The general development of the cortex is much more advanced than that of any of the Mongolians. The cells suggest a granular degeneration. The processes are visible for a long distance, and much entangled. Apparently primary and secondary destructive factors were combined. But there is no special increase in neuroglia. The blood vessels show no changes. A detailed clinical history is given of the case of Myxoedema. It shows a history of hallucinations and prolonged insane delusions. The brain changes are those of an inflammatory degenerative process. The article includes four half-page plates of brain sections, two of Mongolianism, and one each of Cretinism and Myxoedema. These are too small to show much of the changes described in the text. Four more half-page plates are given showing individual cells from the first and second cases of Mongolianism, and from the two cases of Cretinism and Myxoedema. These supplement the text admirably.

By way of interpretation it is pointed out that some of the secondary changes found may have been due to the diseases causing death, and not to the primary causes of arrest.

The article is a contribution to the very limited number of studies on this question. But evidently much more extensive studies will be required to show what the characteristic brain changes are in these types, if there are any that are characteristic.

Faribault, Minnesota.

F. KUHLMANN.

STATEMENT OF THE OWNERSHIP, MANAGEMENT,
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(Signed) A. C. Rogers.

Sworn to and subscribed before me this 7th day of Oct., 1912.

(Seal)

Jean Monty.

(My commission expires July 9, 1915.)



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THE ATTENDANT NURSE OF THE FEEBLE-MINDED

BY HENRY B. GAYNOR, M. D., *Polk, Pa.*

I esteem it an honor to be present at this meeting, and still more I consider it such to have the privilege of directing your attention to the subject of this paper.

The great things and the small in our own political economy and every phase of the feeble-minded from a medical standpoint, have been dealt with more or less exhaustively by master minds. The study of embryonal or arrested mentality, its history, etiology, symptomatology, classification, prophylaxis and care, have each and all been placed before us according to the views of various authorities. We have but to peruse its bibliography to learn the labors of such men as Bonaterre, Itard, Esquirol, Voison, Hubertz, Ehrchricht, Sidney, Seguin, Kerlin, and men of our own time, some of whom are with us today, who are giving their best energies to a chosen work, to find that the subject is exhaustively covered, or apparently so. However, it has often occurred to me that one branch of the many, in the care of the feeble-minded has not received the consideration and thought that we might expect.

I may be looked upon as a novice; professionally nothing more than a fledgeling, but my service during a score of years among the feeble-minded is my justification for the paper, especially as much of the service has been given as an attendant. The literature of my subject is but meagerly covered.

That the attendant, or more properly the attendant nurse, of

the feeble-minded has had some consideration, has to be conceded but to say that he has not had appropriate consideration is a statement which cannot be refuted. I would direct your attention to the attendant nurse, her part in the care of the imbecile, our recognition of her services and what we should require of her. Our standard as applied to the attendant, is at present very low, generally speaking. What do we require? A man or woman to take care of the feeble-minded. Often have we seen the advertisement, "Attendant wanted; wages———" We may or may not inquire into the capabilities and character of the applicant, and the information given is often very broad and not to be taken seriously. The person is employed and his duties are rather indefinitely explained. In many instances it will be some days after the employe has assumed his duties before he meets his chief executive. The matter is summed up by the new employe into so many hours work and the easiest way to accomplish it; so much time off duty and so many dollars per month, until a more lucrative opportunity presents. Besides easy duties and certain emolument, we seldom get attendants who look to the ethical side of their very responsible calling. The personal equation is only seldom worked out and acted upon by the employer. We cannot, of course, estimate a nurse's worth or fitness by casual observation, and yet how very few are the institutions requiring a probationary period.

What should be required is the query that, although primarily in our minds, is seldom acted upon commensurate with the importance that it suggests. The state allots a quota to maintenance which is spent as salaries and wages for the government of its institutions. Education and expert fitness are required in our superintendents and their assistants. Teachers are chosen by their adaptedness for a special line of work and remuneration for such service must be sufficiently lucrative to act as an incentive to those who are willing to embark on such an arduous vocation. The attendant nurse, however, is seldom an educated, and very often not a trained individual for the sphere on which he wishes to embark and his monetary return for services ren-

dered, even when fitted for his avocation, is not such as to tempt him to make it a life's calling.

The normal child we always will have with us and as surely shall we have the feeble-minded. The state requires thorough and exact preparation of its public school teachers and gives them ample incentive to bring forward the best in its pedagogues, but none such is supplied to the nurse who should give his best endeavors to a far more trying and laborious calling—the training of the feeble-minded. Considering our teachers whose work is of supreme importance in a training school, we are well aware that their influence directly affects only those children with whom they have contact and for only a small part of the day. The children so directly influenced constitute a small percentage of the school's population. The attendant nurse, however, takes the other side of this equation. He has his children for the greater part of the day and the major, or properly speaking, the entire school population. Not only has he the intimate relations with his charge, but also during the most important periods of the day. He teaches his ward how to rise in the morning and properly prepare for the day's work. He is with him at table and at his play and sports, on his walks, in his cottage. He teaches him how to retire at night. He commiserates with him in his despondences and troubles and chides or mothers him as necessary.

What I have thus stated an attendant to be is part only of what it should be. These requirements, unfortunately, are not found in all our applicants and yet few are refused when a vacancy exists. How overcome a seemingly glaring defect in our system? By elevating to a proper plane this calling. By impressing upon the attendant nurse the greatness of the work and the responsibility of the calling. By teaching him to look upon his avocation as second to none other. By requiring applicants to furnish evidence of fitness and establishing in our institutions training schools for attendant nurses for the feeble-minded. The training of our attendants will inculcate a more observant faculty. Traits of character and special aptitude of a child will often be brought to the notice of doctor, teacher or matron,

where under the tutelage of an incompetent attendant the keynote to the development of a weak mind may lie forever hidden and the one opportunity be lost, or to say the least, be so long in abeyance as to lessen chances of improvement the older the weakling grows.

With an association like this, where our chief executives meet for deliberation on essentials of institution life and government, it does not seem impossible that a common standard of requirements and training could be agreed upon. It would help mutually, to keep records of resignations and dismissals and to require applicants to furnish properly signed discharges, if previously employed. The scale of wage should be increased and adjusted according to length of service; this emolument varying also as to whether idiot, imbecile, or epileptic was cared for. If this were an established fact, our attendant population would be more permanent and better results would accrue to the children and the institution as a whole. In my experience, nothing demoralizes a classified group of children so much as frequent change of attendants and the loss of time resulting is a serious setback in many other ways, not the least of which is expense. The present scale of wage should be increased somewhat. This matter would take some time as our legislative committees handling the disbursement of state moneys would have to be impressed with the fact that our present maintenance is so low as not to permit of this increase to a class of employes who are not recognized according to services required.

The training school for attendant nurses of the feeble-minded is coming to be recognized and the time is not far distant when it will be looked upon as much an integral part of an institution of this kind as the school of nurses is of any well established hospital of medicine, surgery, or of the insane. The placing of a book of rules or of manuals in the hands of employes is an excellent method of putting before them an outline of their duties and may in exceptional cases cover legal points, or be of use in placing responsibility. Such means, however, fall short of what we expect in the making of our attendants. Reach them through clinical as well as didactic means and we cannot

fail to bring forcibly before them what usually is but cursorily read, little thought about and seldom acted up to when culled from a pamphlet.

In our institution here we have a training school, as yet in its infancy, but the results so far noted are a most encouraging incentive to more expansive and thorough methods. Our attendants are earnest and interested in their work and eager for instruction. They look forward to and prepare for their lectures. Habits of study and observation are in evidence. Queries regarding pupils are answered more fully and to the point. Peculiarities, eccentricities, tastes and personal characteristics of the children are brought to the notice of doctor or teacher on their own initiative and in a direct manner, and as a matter of fact, the children are better and more promptly graded. The lecture curriculum necessitated does not call for a very extended or extensive program, but it does call for teaching along special lines. The work entailed by the staff does not encroach to any great extent on its time and is of benefit to the lecturer as well as to the listener. The results which obtain from a training school, other than those referred to, bring forward the adept. As vacancies of higher responsibilities occur, we will have trained workers ready and the break in routine will be more apparent than actual. That all attendants would be capable or suitable aspirants, I do not even suggest. Still, as our standard improves, so will the intellectual stamina of the class, and many capables will be in evidence. Thus the post of attendant nurse should be a stepping stone to the more responsible positions in line and not a barrier to promotion.

In my few remarks I have essayed to bring plainly to your notice the work of a class of employes in the intricate mechanism of a feeble-minded institution and the necessity of placing this work on a higher plane and requiring more competent workers. I have spoken of their work as it should be in the care and training of the imbecile. That recognition of their work is of primal importance will force itself upon our attention when we fully realize the right of the weak-minded to the best that we have to give them.

RELATION OF BIOCHEMISTRY TO THE PROBLEMS OF PSYCHOPATHOLOGY*

BY AMOS PETERS, Ph. D., *Vineland, N. J.*

The general purpose of the present discussion is to show where the lines of contact are between biochemistry on the one hand and the problems of psychopathology on the other. It is especially intended to point out those topics which offer a favorable field for research into the questions of psychopathology by the method of biochemical study. We shall aim to do this by presenting brief reviews of various biochemical researches whose direct bearing on psychopathological conditions is evident.

Before proceeding, it should be made clear that the immediate aim of the application of biochemistry to this field is simply the elucidation of psychopathological conditions on their physiological side. It is a line of effort co-ordinate with that of the psychologist and means that the same problem is attacked by both so that the subject is approached by two very rational methods of study instead of one of these only. Ultimately, any such comprehensive method of elucidation as this is planned to be will certainly make some important contribution towards the rational treatment or the prevention of the conditions under investigation. Unless, however, elucidation is recognized as the primary and guiding principle much premature and fruitless work may be done. Furthermore we are compelled to proceed on the assumption that there is a physiological basis for all pathological as well as normal phenomena of the human mind. The increase of our physiological and biochemical knowledge shows that this assumption is well founded. What the nature of this relation is, need not now be determined. We are simply postulating such a relation as the logical basis for a physiological study of psychopathological problems. Its further discussion would be useless and we leave this question to philosophy.

*Given before the American Association for the study of the Feeble-Minded at Vineland, N. J., June 4, 1912.

The application of biochemistry to psychopathology appears to us to be possible in two main directions one of which deals with problems of metabolism including development and the other is that of brain chemistry. Under the head of metabolism and development there appear to be three important subdivisions dealing respectively with the topics of (1) the mineral salt metabolism, (2) the intoxications, (3) the glandular secretions. It should be specially emphasized that the importance of these topics is greatly enhanced when their relation to the problems of development is added to their by no means small significance when referred to adults. The fact that many of the problems of psychopathology involve the factor of heredity and development thus makes the application of the biochemical method all the more important.

By metabolism we understand, of course, the sum total of the chemical changes which a living organism continually performs within its tissues and upon the substances which it utilizes. The progress of biological science has made the term practically synonymous with the processes of life in so far as they are non-psychical. The body, from muscle to brain inclusive, is a most active and complicated chemical machine. The present discussion then seeks to determine whether the results of investigations thus far made justify us in expecting to find physiological or biochemical marks of the psychoses with which we are familiar. Is there a reason to think that feeble-mindedness, infantilism, are the visible expression of a deranged chemism of brain and body, whether adult or developmental? This question we shall attempt to answer by giving some illustrations from biochemical literature under each of the subheads above outlined.

The mineral salts have long been known to be essential for the growth and maintenance of the animal body. They are not regarded as sources of energy like proteins, carbohydrates and fats. Experiments on the function of mineral salts were made by Foster, J., *Zeitschr. f. Biol.* 9: 297. 1873. He fed animals with an ample supply of proteins, carbohydrates, fats and water but with the least possible amount of mineral salts. Pigeons

died in two to four weeks, and dogs after two to three weeks showed muscular weakness and trembling. Their senses became dulled and they failed to take interest in their surroundings. Unless salts were then added to their food they died of cramps and suffocation. These symptoms show that the nervous system was prominently affected by the want of essential mineral salts. These results are merely indicative of the significance of this topic and more recently data of similar significance have been obtained on the brains of human infants.

Another study of this topic comes from Hoppe, J., **Ein Beitrag zur Kenntniss des Mineral-Stoffwechsels der Idioten**. He first calls attention to the frequency with which idiocy develops in association with infections or nutritional diseases of childhood. He estimated the number of such cases as about fifty per cent. of the total number of idiocies. The frequent association of rachitis and idiocy is very noticeable. The conditions in rachitis work injury to the tissue of brain and nerve. From the chemico-pathological standpoint rachitis presents a disturbance of the calcium and the phosphorous metabolism. This same disturbance of mineral salt metabolism is found in many cases of idiocy especially in cretinism and myxoedema. Both idiots and rachitics show a want of phosphorous and calcium in the bony system. Elimination of these substances by way of the intestine is too large and by way of the urine too small by comparison with normal conditions. Hoppe found that the administration of thyreoidin increased the resorption of phosphorus containing compounds from the intestine and also increased elimination of phosphorus in the urine. At the same time the growth of the bones became noticeable.

We shall not go into any detail on the subject of intoxication. The results thus far obtained are obscure especially the chemical nature of the toxic substances. However, the evidence abundantly indicates that toxic agents are very important factors even in the pathology of the nervous system. Epilepsy especially has been approached from the standpoint of intoxication and much evidence pertaining to this factor of the disease has been obtained. The newer management and treatment by hygienic

measures rests both on experience and on a theory of deranged metabolism leading to intoxication.

In this connection we should mention the work of Kauffmann, M., *Beitrage zur Pathologie des Stoffwechsels bei Psychosen* 1. Teil; *Die Progressive Paralyse*. 388 S. 2. Teil; *Die Epilepsie*, 199 S. 1908. Here intoxications are frequently referred to, e. g., nervous indicanuria, lowering of the freezing point of the blood, periodical formation of acids and excretion of same in the urine. Here also was noted the slowing of oxidations, e. g., of camphor, benzol, etc. Other disturbances of oxidation were observed which result in faulty utilization of the sulphur and the nitrogen of protein. There was also disturbed purin excretion.

No other part of the field of physiological investigation has thus far come into such close relation to the problems of psychopathology and of abnormal development as the study of the glands of internal secretion. The pineal, pituitary, thyroid, parathyroids, thymus, adrenals, and the sexual glands all seem to have intimate relation both to the proper development of the human body and to its proper psychical functioning. The broad outlines of this important relation are well established by extirpation experiments on animals, surgical operations on man, experiments on gland feeding and gland transplantation and by the results of autopsies on authenticated cases. The nature of the relation between these glands of internal secretion and other distant organs and the brain is not made out in detail but is still a fruitful subject of investigation. Formerly all correlations between distant organs were regarded as exclusively mediated by the connecting nervous system. Today the numerous facts which investigation is continually developing tend to make chemical correlation by means of internal secretion equal to, if not of even greater significance in the animal mechanism than that of the nerves. In short, an organ may secrete a substance which is carried to another distant tissue and there it may play a critical part in the functioning of the latter. These facts have great importance in the physiology of growth and development in relation to the problems of psychopathology. These glands are pre-eminent-

ly glands of metabolism and the biochemical study of the latter in relation to the internal secretion becomes therefore an important means of investigation. No other somatic organs with the exception of the brain have so close and evident a relation to psychical conditions especially of the young. The superficially planned administration of gland extracts frequently practiced in our institutions for the insane and the feeble-minded should be discountenanced. Such experiments should be accompanied by a quantitative examination of the disturbed metabolism which is their most evident effect. Psychological examination alone is certainly very inadequate from a scientific standpoint and this point of view is the only one which can thus far justify such experiments.

By Josefson, A., *On Infantilism*, we find the view expressed that probably every case of infantilism can be connected with disturbances of the glandular secretory system. Furthermore it is not probable that one gland alone can be made to account for this condition and thus we are brought to the more recent pluriglandular theory of the origin of abnormalities of development. According to this view the entire glandular system dominates the processes of growth and development and thus stands in the most intimate relation to the problem of feeble-mindedness. Experiment shows that the interaction of these glands is so extensive that a disorder of one at once produces effects upon another and upon other organs which again react upon the original gland thus tending to establish the well known vicious cycle. If we imagine such process as this to occur in the early uterine life of the organism or even in the adolescent period of the individual it is not difficult to conceive of the consequent derangements of body and brain with which we are familiar.

To discuss the relation of each gland of internal secretion to the psychopathological problem would require the development of almost the whole subject and is not here feasible. Before leaving the subject of metabolism we would like to call attention to two papers written independently but which throw a correlating light on two sides of our subject. These are the following: Homburger, A., **Koerperliche Stoerungen bei funktionellen Psy-**

chosen, *Deut. med. Woch.* 35: 1134-1137. 1909. Also Bonhoeffer, *Ueber Psychosen in Gefolge innerer Erkrankungen*. *Deut. med. Woch.* 35: 226. 1909. Setting side by side the contents of these two papers enables one to approve the following statement of the reviewer of the previously cited book by Kaufmann that, "All these investigations show that there are more co-ordinate relations between brain and other organs than has hitherto been supposed."

When we turn to the application of lipid and brain chemistry to the problems of psychopathology we are at once confronted by the difficulty of method or technique. The methods for the investigation of the chemistry of the brain are at the very beginning of their development and thus stand in strong contrast to the progress which has been made in the technique for the study of metabolism. There is here, however, a field which has promise in its cultivation as judged by the results already obtained when considered with reference to the brief time that this subject has received attention. Furthermore, here as elsewhere, biology turns from a well worn morphology to the biochemical and biophysical study of the organic substance in which lie the secrets of the morphological structure. Whether the morphological and the biochemical methods of approach can ever be united in a micro- or a histochemistry of brain and nerve we cannot foresee. Judging from literature already published, the biochemistry of the brain is sure to be pursued in the near future with results of importance from the standpoint of the psychopathologist.

REPORT OF MEDICAL RESEARCH AT THE TRAINING
SCHOOL FOR FEEBLE-MINDED CHILDREN,
VINELAND, N. J.

BY DR. WALTER S. CORNELL, *Philadelphia.*

Mr. President, Ladies and Gentlemen: The medical research work carried on at the Training School during the last three years is partially shown by some fifteen charts here displayed. At the outset it is well to remark that nothing startling or of great importance has been discovered, except, possibly, the uniform low blood pressure of the feeble-minded and the progressively lower blood pressure seen in the sub-groups, morons, imbeciles and idiots.

The work of medical research was begun in the summer of 1908. During the summer of this year and the summer of the two succeeding years, four medical students from the University of Pennsylvania were employed as internes in the institution. These students who had previously been trained in laboratory work made very satisfactory examinations although the work done during the first summer was largely discarded because of gradual improvements in our methods which in turn necessitated revision of the material already gathered. Somewhat over a year ago the Training School employed Dr. Arvilla Lang, a graduate of the Women's Medical College, of Philadelphia, as permanent clinician, and since then the work has been done rapidly and systematically with a resulting complete physical examination of every child in the institution.

The record chart used by the division of medical research at the Training School provides for three complete physical examinations made at different times. Each examination in turn includes the examination of the eyes by an ophthalmologist, an examination of the nose and throat, ears, teeth, nutrition, the nervous system, skeleton, heart, lungs, kidneys, and blood. Under

the heading of kidneys is included a complete urinalysis and under the heading of blood is included the counting of the red and white corpuscles, the estimation of the hemoglobin and the Wasserman reaction. The blood pressure is also taken. Under the heading of nervous system just mentioned is included evidence of functional nervous disorder, organic disorder and the general nervo-muscular tone. Under the heading of nutrition has been particularly listed the subject of anemia and those skin diseases dependent upon poor nutrition, but the heights and weights of the children are not included because these figures have been already obtained by Dr. Goddard in connection with other work. The cranial measurements listed under orthopedic investigations have been taken with the idea of studying the relative height—size of the children of different mental grades, and also to obtain the cephalic index. We are aware that external head measurements bear but a loose relation to the actual size of the brain but when gathered statistically we have assumed a general relation.

The eye examinations were made by Doctors H. Maxwell Langdon, of the University of Pennsylvania, J. Norman Risley and J. Milton Griscom, of the Wills Eye Hospital. Not only was the visual acuity determined in the case of those children who were intelligent enough to proclaim what they were able to see, but the refractive error in each case was estimated by the ophthalmoscope using a cycloplegic when necessary. Evidence of optic nerve disease was sought in the hope of making a better pathological diagnosis of many of the cases.

As regards the ear examination, Dr. Lang has done special nose and throat work in two of the Philadelphia hospitals and the data are accurate so far as inflammatory disease is concerned. The acuity of hearing, however, is difficult to determine with the lower grades of these children and the proportion of defective hearing due to internal ear disease is much higher than in normal persons. This makes the examination of the ear and hearing a rather difficult matter.

The results of our work must here be only sketched as a

detailed description would necessitate many times the space here allowed. Summarized, the following salient points brought out in the work are as follows:

BLOOD PRESSURE

The blood pressure of the feeble-minded is almost always below normal and average figures show that the blood pressure is extremely low in the morons, imbeciles and idiots. The only exception on the chart prepared by us is in the case of imbeciles six to eight years of age, and doubtless the small size of the series produce misleading figures in this one instance. The details of these findings will be published in another paper. They are particularly important, however, because of the combined action of the pituitary gland upon the blood pressure and the mentality, and also because of the influence of the suprarenal glands upon the blood pressure.

The Mongolians show remarkably low blood pressure, so low, indeed, that bleeding of the gums was induced by the administration of a mixture of pituitary and thyroid extracts.

BLOOD FINDINGS (AVERAGE FIGURES)

Hemoglobin: Morons and imbeciles, 80 per cent.; idiots, 70 per cent. **Leucocytes:** All three groups, 7,000. **Red Blood Corpuscles:** Morons, 4,000,000; imbeciles, 3,800,000; idiots, 3,500,000.

CRANIAL DIAMETERS

There was a steady increase in the diameters in both longitudinal and transverse diameter according to age and according to the mental grade. According to age, the children were placed in four groups—six to eight years, nine to thirteen years, fourteen to twenty years, and twenty-one years and over. With the idiots, six to eight years, the average length was 168 millimeters; breadth, 137 millimeters. The adult morons showed an average length of 187 millimeters; breadth, 147 millimeters. Whipple's book of physical and mental tests gives the average diameters for the normal adults as: length, 189 millimeters; breadth, 149 millimeters.

CEPHALIC INDEX

This was usually .78 to .80. The normal is usually stated as ..

.77, thus showing a tendency toward a short head. The Mongolians who are noticeably brachycephalic, showed a cephalic index of .84 to .85.

TUBERCULIN TEST

The tuberculin vaccination (on the arm) carried out on three hundred seventy-four children, showed positive reaction in twenty-nine per cent. of cases. The greatest prevalence was in the group fourteen to twenty-one years of age, thirty-six per cent. of whom showed a positive reaction.

WASSERMANN RE-ACTION

The Wassermann reaction on 376 cases gave 21.05 per cent. of the cases positive, of whom eleven, or 2.9 per cent., were strongly positive. Although this figure has been paralleled by the results of Doctors White and Ludlum at the Philadelphia Hospital and their figures on the feeble-minded have been published showing both higher and lower percentage results, it is the feeling of the writer that we should be cautious in accepting a positive Wassermann reaction as absolutely diagnostic of syphilitic affection. It is interesting in this connection to note that 24.74 per cent. of the morons showed a positive reaction while 19.71 per cent. of the idiots and imbeciles showed a positive reaction.

URINALYSIS

Urinalysis of three hundred ninety-nine cases was generally negative except that thirteen cases showed sugar and ninety-four showed indican. The latter phenomenon was doubtless due to constipation which is very prevalent in the feeble-minded due to general sluggish vitality and lack of exercise. The finding of sugar in thirteen instances may point to a lowered carbohydrate tolerance which in turn may signify some abnormal degree of pituitary function.

REFRACTIVE ERROR

Refractive error was extremely prevalent and was progressively worse with descent in the mental scale. Thus, 49.1 per cent. of the morons, 61.5 per cent. of the imbeciles, 69.6 per cent. of the idiots possessed eyes warranting the use of eye-glasses if their possessors were intelligent enough to wear and use them.

Significant was the presence of myopia—thirteen per cent. of the morons, twenty per cent. of the imbeciles and eleven and one-half per cent. of the idiots showing this defect.

EYE DEGENERATION

There was an examination of the eye-grounds which showed a surprisingly small percentage of nervous degeneration or inflammation. This rather unexpected finding really indicates that syphilis does not play such a role in the causation of feeble-mindedness as some writers believe. The only noteworthy finding in the eye-grounds was a general pallor of the visual field which pallor the writer is inclined to attribute to anemia and low blood pressure, a condition which produced a tendency of the blood to gravitate to the lower parts of the body.

HEART DISEASES

Valvular heart disease existed in twelve per cent. of all cases. There was no means of differentiating the congenital cases from the acquired cases.

FLAT FOOT

Flat foot is extremely prevalent in the feeble-minded, even the boys of fourteen and fifteen years old showing the defect in a large proportion of cases. This inclines one to believe that flat foot is caused as much by relaxed muscular tone as by heavy body weight.

WEIGHT AND HEIGHT

The weight and height were not taken in this series as Dr. Goddard has already compiled and published a curve showing the relative measurements of the normal, moron, imbecile and idiot.

INVESTIGATION AS TO THE INFLUENCE OF PITUITARY EXTRACT

Investigation of the influence of pituitary extract upon the mentality of the feeble-minded was tested by the administration of pituitary extract to several Mongolians. In one case a mixture of pituitary and thyroid was given. The effects of the drugs were evident in so far as the blood pressure and pulse were concerned but no mental improvement was seen.

PROPORTION OF TYPE CASES TO GENETOUS CASES

Of three hundred seventy-five children in the Training School, thirty-eight, or ten per cent. are type cases. Of the latter, eighteen are Mongolians. The proportion of the feeble-minded presenting definite type characteristics is given as approximately fifteen per cent. by most authorities so that our figures are somewhat low.

DISCUSSION

Dr. Fernald: Mr. President, I would just like to have Dr. Cornell inform us how the degree of myopia is ascertained or measured with the imbecile and with the idiot.

Dr. Cornell: It is measured with the ophthalmoscope.

Dr. Fernald: How does your oculist manage to measure the error of refraction?

Dr. Cornell: We have two groups of children, those who are able to read and write and those who are not. With the first group the visual acuity is estimated by the ordinary Snellin type, and then an estimate of the refractive error is made without the use of the cycloplegic in the majority of cases. The children are taken in a dark room and the pupil dilated sufficiently to allow the examiner to look at the retina with the aid of an ophthalmoscope. In the case of those who are too young or too weak-minded to read, a cycloplegic was used before the refractive error was estimated.

Mr. Van Wagenen: I want to ask Dr. Cornell if he can tell us what the normal standard of blood pressure is and if it varies with different types of idiots. I happen to know three adult persons whose blood pressures are respectively, 120, 155, and 225.

Dr. Cornell: The systolic blood pressure in health varies between one hundred and forty and two hundred, usually about one hundred seventy-five. The blood of the feeble-minded is characteristically low and among the Mongolians is extraordinarily low. In individuals of normal mentality, that is to say ordinary persons, a low blood pressure results from anemia, nervous prostration and a weak heart, and other causes. On the

other hand, in ordinary persons the blood pressure rises when the heart is excited and pumps too hard or when poisons in the blood stimulate the nerve centers to constrict the blood vessels and thereby increase the tension. In our studies the blood pressure was 135 millimeters in the pupils of adult years and 115 millimeters for those between fourteen and twenty years.

Mr. Van Wagenen: I do not think that anything has been said about it here today, but I believe there was an attempt made at one time, in blood analysis, to determine the question of leucocytes. We found them to be very deficient when compared to normals. Have you any information on that?

Dr. Cornell: The leucocyte count averaged seven thousand which is normal except in the case of the Mongolians, some of whom showed a remarkably low leucocyte count—as low as two thousand. There were some Mongolians, however, who showed a normal leucocyte count.

Mr. Van Wagenen: Were there any cases where they were entirely absent?

Dr. Cornell: We had no such cases but I understand that De Sanctis in Italy examined some Mongolians in which no leucocytes were found in the blood.

Mr. Van Wagenen: Hasn't the Mongolian type a lower percentage?

Dr. Cornell: Yes. I remember that fact distinctly. We had two Mongolians with a leucocytosis. If we had, say, eighteen Mongolians, fifteen were below the average and two or three were above the average; but the majority of them were below the average.

Dr. Holmes: With reference to blood pressure, it seems to me unfortunate that there is such a wide variation in the normals. Personally, I think that what is normal for one is not normal for another. I know that in my own practice I have met with cases of blood pressure of over 200 where I have prognosticated and looked forward expectantly to some serious outcome in the patients, for instance, seventy-five or eighty years old, and nothing has yet happened in the course of two or three years. It seems to me, also, that no two people who deal with

blood pressure are apt to determine it alike in the same individual. There is such an opportunity for error in the readings. It seems to me we never can have any accurate data for blood pressure until we have some mechanical contrivance to register it. If we can eliminate the human element of reading the blood pressure, which is variable and open to error and criticism, it would be a great help. I, for that reason, am a little skeptical of the value of blood pressure as read by different people. There is another thing which occurs to me, an instrument that two or three years ago was considered accurate is no longer considered so. It was only the other day that I was in an instrument store where I was asked to buy a new blood pressure apparatus and was told that it was far superior to the one I knew myself, which latter, I was told, was entirely wrong in its construction and could not be relied upon. I have been told the same thing by other physicians who use such apparatus. So there is another source for discrepancy and error in the instruments themselves, they not being as yet fully perfected and accurate.

Dr. Emerick: Dr. Cornell suggested that different reactions in different countries might possibly explain the fact that some of the normals of those countries are not due to the technique. In our institution we examined something like ten hundred and fifty cases and our percentage was not near so high.

Dr. Charles Bernstein: I would like to ask Dr. Cornell, as he says this is the most important chart he has shown us, and as he says that blood pressure is higher in the higher, and lower in the lower mental grades, what lead this has given us.

Dr. Cornell: I agree with the gentlemen who have mentioned the influence of the examiner in recording the blood pressure of the patient. Our blood pressure tests were all made by one examiner, Dr. Lang, so that at least there is no variation on personal grounds. As to the meaning of the low blood pressure of the feeble-minded it may signify a relaxed nervous tension or it may signify a lack of some of the internal secretions such as the adrenal or pituitary secretions which influence the blood pressure. There may of course be other reasons but they have not so far been apparent.

A PRELIMINARY REPORT ON WASSERMANN TESTS

BY WM. J. G. DAWSON, M. D., *Eldridge, California.*

In July, 1911, I received a communication from Prof. E. R. Johnstone, of Vineland, N. J., requesting me to let him know what line of research work I would be willing to carry on during the year. As we had already begun the Wassermann tests in our institution I wrote Mr. Johnstone that I would report on as many cases as we were able to complete in time for the next meeting of the association.

We began the Wassermann tests on the inmates in the Sonoma State Home on July 7, 1911, and up to and including May 5, 1912, eight hundred and eighty tests have been made. Positive tests were obtained in thirty-five cases, equal to four per cent.; indefinite reactions in seventeen cases, two per cent.—these to be repeated later with the Noguchi test or Luetin Skin Reaction. Of the thirty-five tests obtained twenty-two were males and thirteen females. The prevailing ages of males were nine to twenty-nine years, oldest male (feeble-minded), giving positive reaction, seventy-four years. The prevailing ages of females were twelve to twenty-six years, oldest female (epileptic, f.-m.), giving positive reaction, sixty-four years. Nationality: American, thirty-three; Mexican, 1; Canadian, 1.

Grade	Male	Female	Total
Moron	8	7	15
Imbecile	11	4	15
Mongolian	1	0	1
Idio-imbecile	2	2	4
	<hr/>	<hr/>	<hr/>
	22	13	35

Of this number, on the male side, one was a moron mute; one, an idio-imbecile; four were epileptics; four were paralytics and one was a case of athetosis. Of this number, on the female side, one was an imbecile mute; four were epileptics and one a paralytic combined with athetosis.

The prevailing order of birth in the different families was as follows:

First born	12
Second born	5
Third born	4
Ninth born	1
Eleventh born	1
	<hr/>
	23

The remaining twelve were fourth and fifth born in order of birth.

Family histories of the thirty-five positive cases were as follows: Three gave positive luetic histories; five gave suspected luetic histories, two of which also gave histories of feeble-mindedness in the the family. In eleven cases feeble-mindedness was found in the family, of which four were the mothers; five, being sister or brother or both, some of whom are in the home. Six showed insanity in immediate relatives and two of these families had suspected luetic histories. In the remaining fifteen no family histories of lues or other constitutional disease were obtained. Two brothers, inmates, both gave positive reactions; one sister, (first in order of birth) of a family of three inmates, gave positive reaction; one sister, (first in order of birth) of a family of four inmates, gave positive reaction, the others tested being negative.

From this number, as already stated, the percentage of positive tests obtained was four per cent. This is a small percentage as compared with some reports but it is not right to draw conclusions on less than 1,000 cases and the Wassermann should be confirmed by the Noguchi, or other tests.

The administration of salvarsan, (intra-venously) was begun Dec. 3, 1911, only four cases so far being treated. Dr. Grace S. Linforth, who is carrying on the Wassermann tests for us and who is also assisting in the same line of research work in the Letterman General Hospital at the Presidio, San Francisco, Calif., states that from their experience in the latter hospital results cannot properly be determined from the laboratory point of view for

at least two years and probably longer.

From my own clinical observation I must admit that we have found, in the four cases treated, no marked change in the mental conditions nor do we expect any until these cases have received two or more treatments according to the findings by Wassermann or other tests.

Dr. Linforth states that she has found in the normally minded individuals (acquired cases) a less marked negative reaction by the Wassermann tests after the administration of Salvarsan than in the feeble-minded cases (hereditary) treated in our institutions; the latter, giving a quicker response in becoming negative ascertained by more than one Wassermann test.

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EDITOR:

A. C. ROGERS, M. D. - - - - Faribault, Minn.

ASSISTANT:

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THE DEATH OF DR. KNIGHT

Twice since the June meeting at Vineland have we been called upon to chronicle the death of a member of our Association circle. Following closely after Mr. Carroll's death, came the shocking intelligence that Dr. George H. Knight, of Lakeville, Conn., had been suddenly stricken down from apparent good health.

On the evening of October 4th, while acting as chairman of a political meeting at Lakeville and in the act of introducing a speaker, he dropped unconscious upon the stage and expired in a short time.

No one in the association has been so closely and so long identified by personal and family connection with the work for the feeble-minded in this country. His passing produces an unusually profound sorrow in the hearts of all who knew him.

A later number of the Journal will contain a more extended notice of him and the Lakeville institution, which latter is quite unique in the history of American institutions.

Mrs. Knight has been asked by the authorities to assume executive control of the institution.

SELF-SUPPORTING FEEBLE-MINDED

The larger recognition of the two facts of (a) the very large number of feeble-minded, and (b) the large expense of segregation, gives rise to the discussion of various plans for meeting the situation, most of them old ones. The placing of feeble-minded in private families and the organization of self-supporting colonies are two plans quite frequently referred to, but often without a clear comprehension of the situation or the experience of the past.

It is quite natural for one who sees the various kinds of work done by the trained feeble-minded of the higher grades, to assume that the persons who can do such things are quite competent to go out into the world and get along independently. They could, of course, if they were not feeble-minded. That fact seems to be lost sight of. In other words, the condition of mental defect involved in the term itself, implies an inability to cope with the economic and social requirements of life. All around us are failures of this very kind. The largest part of the population of our institutions for defectives comes from this class of social and economic failures.

Our training schools for the feeble-minded do not perform any miracles. Their function is to determine the capacity of the child and train the limited capacity. What he does, any one, of course, could do and that with only a fraction of the training the feeble-minded receive, if of normal mind, and possessed of a de-

sire to do it. Possibly this practical training of manual and industrial capacity has been too much neglected in the public schools in the past; in any event, it is the practical thing for the mentally deficient. On the other hand, the higher faculties by the exercise of which the individual adjusts himself to the requirements of life, are not his. He lacks in judgment, self-control, ability to adjust himself to changed conditions, and usually inability to maintain sustained effort or continuity of purpose. Only in a very limited way does he recognize the relation between cause and effect, or perceive the relation which his little world of employment bears to the general scheme of which it is a part.

With those whose business it is to anticipate his shortcomings and his overdoings, he gets along very well. The first thought of the uninformed observer is, "That child would do all right in any good family." Placed in a family, if in one familiar with his previous untrained condition, his acquired ability to do, is noteworthy and seems to promise success. While under the stimulus of close observation and friendly encouragement, things move smoothly if the requirements are not too exacting. Left to carry out instructions or to work independently the lack of dependability is soon manifest. If a boy at work on the farm, he forgets to shut the gate and the cattle get into the corn; a broken harness is tied up with one of the lines; the plow is left at the distant side of the field when the day's work is done, though it will be needed in a different field in the other direction on the next morning, and in bringing it the clevis is lost, and thus two hours are wasted in getting to work. If a girl at work in the house, in divers ways the same lack of forethought and a marked maladjustment of acts to occasions, are characteristic. Thus what is condoned in the mental deficient when considered as such, becomes hopelessly unbearable to the ordinary family, when the offender is expected to be a dependable factor in the family economy. Of course there are occasional families imbued with the missionary spirit that patiently bear with such shortcomings, but they are rare, and the number is too inadequate to be a factor in any general placing plan. Neither is there

any indication of such a growth of altruism that the placing out scheme will be feasible in the near future.

The self-supporting colony idea needs to be explained. If one means by this that it is possible to train a group of boys in handicraft or soil tillage and organize of them a self-supporting institution, there is no reason why such a scheme could not be made to work if the boys all belonged to the high grade moron group. One can imagine that there might be local conditions that might justify such an organization, but this is not meeting the great problem of the feeble-minded. The moron group is the smallest by far in the present population of institutions for defectives and their productive industry in the general village community does them the same credit there that it would anywhere else, without the necessity of duplicating the organization. Individually they are of more importance in the village community than in general society. In the former they find higher grade employment such as printing and mechanical construction and their services there are needed.

In the general population, morons probably constitute the largest group of mental defectives—though many of them are not generally recognized as such. It is this fact that suggests the organization of special industrial communities for the higher mental grades. Whether justified in any given community or not would depend upon the facts in that case, but the larger problem should not be lost sight of.

The essential thing, of course, is to recognize the limitations as well as the possibilities and to meet the conditions in a broad and comprehensive manner.

A. C. Rogers.

REVIEWS AND NOTICES

Experimental Studies of Mental Deficiency. A Critique of the Binet-Simon Tests and a Contribution to the Psychology of Epilepsy. J. E. WALLACE WALLIN, Ph. D., Baltimore: Warwick and York, Inc., 1912. Pp. VI+155. Price, \$1.25.

This monograph reports the results of examining 333 epileptics of the Skillman, New Jersey, institution with the 1908 series of the Binet-Simon tests, together with those of several other tests used at the same time. A final chapter gives a statement of the tests to serve as a practical guide in their

administration, more fully standardizing modes of procedure and of interpreting responses than is given in the original account of Binet and Simon.

The first chapter presents the data on a distribution curve giving the number of cases that fall under each of the mental ages of the Binet-Simon scale. This curve is compared with the similar curve for 378 feeble-minded at Vineland, New Jersey. The comparison shows that the greater number of the feeble-minded are of the imbecile grade while the greater number of the epileptic are of the moron grade; that while the curve for the former is fairly regular that for the epileptic is markedly skewed, showing a drop in the number of cases mentally five, and a still greater drop for the number of cases mentally nine. The larger part of the monograph is devoted to a minute analysis of the results in discussion of this skewed character of the curve, since this might indicate defects in the system of tests or in the manner of their use. Two possible reasons are given for the relatively greater number of morons with the epileptics as compared with the feeble-minded. (1) The epileptics were chronologically older than the feeble-minded at Vineland, and because of some chronological age influence in the tests the epileptics would tend to grade higher than the feeble-minded. (2) The epileptics at the Skillman institution may not have been representative, some selective process having operated tending to admit a relatively greater number of morons. But even with these possibilities taken into account, the author concludes that the epileptic are of a higher grade mentally than are the feeble-minded. This conclusion, although possibly quite correct, does not seem to me to follow from the data given by the author. There are undoubtedly many more morons with the feeble-minded than of the other grades, just as with the epileptics. This follows from the supposition that the smaller deviations from any normal will occur more frequently than the larger deviations. The fact that the number belonging to the different grades of feeble-minded does not give us the normal distribution curve to be expected rather indicates that some selective process has been operative here also in the admission of cases. This comes about through the fact that the average layman sees the need of admitting a case to an institution the less the more nearly normal a case is. In the case of the epileptic, however, the epilepsy is an additional reason for sending a case to a special institution for care and treatment, and this reason applies equally to all grades of mentality of the epileptic. Hence there are more moron epileptic in the institutions, admitted for their epilepsy, because there are more moron epileptic in society, but there are not more morons, admitted for their feeble-mindedness, in the special institutions.

Several possible reasons are first given for the skewed character of the distribution curve. The factors responsible for it "may reside in the method of giving the tests, in the method of scoring, in the defective nature or arrangement of the tests themselves, in the peculiar mental organization of the epileptic, or in the averaging of the results for both defective children and defective adults." The detailed analysis of the results following, including

over thirty tables and curves, attempts to decide which is the case. First, the question of scoring. One of several methods of scoring may be used. If a child, for example, passes all tests up to and including age V, fails in some for VI, VII, VIII, and IX, but passes all in X and a few beyond X, we may (A) give him a mental age of five plus advance credits for all tests passed beyond this, or (B) we may give him a mental age of ten plus advance credit for tests passed beyond X, or (C) we may give him a mental age obtained by averaging the two ages for the "A" and "B" methods. Dr. Wallin attributes the "B" method to Binet and Simon, and also to Goddard at Vineland. In individual cases the mental age may vary over two years with these three methods of scoring. He concludes from his analysis that his method of scoring, the "B" method, may partly account for the skewed character of the epileptic curve, but that it may "probably be neglected, more particularly because it has conformed with the prevailing usage, thus rendering the results comparable with the findings of other investigators." Likewise, it is concluded that his procedure of testing each child with a wider range of the scale than seems to have been done at Vineland can only in a small measure be responsible for the skewed curve. The relative degree of difficulty of the different individual tests is next determined by finding the percentage of the number of epileptics that pass each test. From this analysis he finds an "amazing lack of uniformity between the difficulty of the tests of the same age-norms for fully half of the ages of the scale—amazing from the standpoint of precision demanded by the standards of scientific work," and that his analysis "has demonstrated that there is a greater discrepancy in the B.-S. 1908 scale than has hitherto been conceded or suspected." The individual tests that are too difficult or too easy are indicated and the results compared with those of some other investigators. As to how much of this lack of uniformity shown in the tests from results with the epileptic is due to defects in the system of tests and how much is due to peculiarities of the epileptic mind cannot be ascertained with certainty. But it is noted from the results themselves that the epileptic "suffer from a fundamental impairment of memory," that they are markedly retarded in the rational functions, and show a "pronounced retardation of rate in the stream of thought and of motor response."

The value of the scale is next tested by plotting age-curves for the individual mental traits tested in the scale, and for a few special tests. In this the course of improvement is followed out for a given test through the different mental ages from lower to higher. The tests chosen are, (1) time needed to name four colors; (2) time needed to read a passage; (3) time needed to place blocks in a form board; (4) number of words given in three minutes; (5) strength of hand grasp; (6) ataxiagraphic sway. The effect of chronological age and sex is considered in each of these tests. The scale of tests fares better in this analysis than in that of the preceding chapter. For it is concluded that, "While it does not scale different grades of intelligence with the degree of accuracy which would be desired, it does enable us to grade and

classify defective individuals far more rapidly and satisfactorily than would be possible by the ordinary methods of observation," and "Whatever its imperfections, it affords a practical, easily administered, objective, systematic method of grading defective children which.....approximately locates the mental station of the individual." Some chronological age, maturity influence is found in most of the tests just named, but it is not considered so large as to invalidate the use of the scale for both children and adults. Likewise, certain sex influences are found, but the question as to whether we shall need two different scales for the two sexes is left an open one. The chapter closes with a strong note of warning against the use of the tests by unskilled examiners, and that in any case the results of the Binet-Simon tests, or of "any other graded scale of intelligence" are to be used merely for a preliminary, rough, rating of a child's intelligence, and that there remains "the more difficult task of making a detailed, expert diagnosis for each case and a diagnosis of each fundamental trait or capacity."

The fourth and closing chapter gives a statement of the 1908 series of the tests, to which are added more detailed directions as to how each is to be given and used. Greater uniformity in procedure is strongly urged, which requires more specific directions than Binet and Simon have given. The author thinks it advisable to gather more data than we as yet possess, following a standardized procedure, before revisions are made in the scale.

The monograph is an example of a keen and exhausting analysis of the data gathered, and in this method of treating the data lies its chief value rather than in the conclusions that one may obviously draw from them. In the reviewer's opinion, the epileptic mind is, in the first place, too different from that of the typically feeble-minded to make the results of the Binet-Simon tests with the epileptic of any great value in determining the accuracy of the scale in measuring general intelligence. In the second place, the 333 epileptics examined are not a sufficient number to do justice to the splendid method of analysis used. The several classifications into children and adults, males and females for each of the mental ages, for example, very frequently leaves only one to several cases under a given heading from which to compute averages, percentages and mean variations. Many of the conclusions drawn from the statistical analysis suffer from lack of sufficient numbers. These two facts combined have made the task of accounting for the skewed character of the distribution curve for the epileptic a difficult one, and, in the reviewer's mind, it has not been satisfactorily accomplished. Moreover, since the same curve for the feeble-minded and for normal children as well has not shown such skewed character, the presumption is that Dr. Wallin's results with the epileptic must be due to other factors than the defects in the scale of tests. Two other matters may be mentioned. The author, as was noted above, attributes the "B" method of scoring the mental age to Binet and Simon, and also to Goddard, and regards it as the one generally used. I have myself always used the "A" method and regard it as quite the fairest of the three. The author is in error, I believe, in attributing the "B"

method to Goddard. Binet and Simon's rule, if taken literally, indicates the "B" method, but it may be interpreted as leaving out of account the irregular and more or less unusual result in which a child passes all tests of a higher age-group and fails in several of a lower age group. This seems to me the proper interpretation, and, if made, the rule gives the "A" method of scoring. Since the mental age of a child may vary over a range of over two years according to the method of scoring followed, the point is seen to be of considerable importance for the cases that give irregular results on the tests they fail in and pass. The second matter concerns the advisability of continuing with the 1908 scale under more standardized conditions before making any revisions in it. The reviewer is entirely in harmony with the author's strong plea that the scale should be better standardized with reference to modes of procedure with the individual tests. But such standardization is not incompatible with a number of revisions and adaptations to American conditions which results up to date fully justify and demand. The American revisions published may have introduced new errors, but no one who has followed the history of the tests can claim that Dr. Goddard's revision, for example, has not materially improved the accuracy of the scale on the whole. The reviewer, further, cannot refrain from noting that while the author dates his preface "February, 1912," the book did not come to the reviewer's hands from the publishers until January, 1913. As a guide to the present status of the Binet-Simon tests it is already quite out of date, which is at once obvious from the absence of references to much important literature that has appeared since the date of the preface.

Faribault, Minnesota.

F. KUHLMANN.

Health and Medical Inspection of School Children. WALTER S. CORNELL, M. D., Philadelphia: F. H. Davis Co., 1912, Pp. V+614.

The writer of this timely volume has had six years of experience as medical inspector in the public schools during which time he has examined some 35,000 children. He defines his aim as that of presenting "a practical exposition of the work of medical inspection.....and to give to physicians and teachers a survey of medical practice as it relates to children of school age." This exposition is given in three sections, (1) medical inspection, (2) hygiene, and (3) defects and diseases, two-thirds of the book being devoted to the last section. The object of medical inspection is outlined as follows: "(1) Detection and correction of physical defects. (2) Detection and exclusion of cases of parasitic and contagious disease. (3) Maintenance of good hygienic conditions. (4) Diagnosis and treatment of mental deficiency. (5) Correlation of medicine and pedagogy in order to produce the maximum of efficiency in the school system consistent with the preservation of health." The efficiency of medical inspection depends on a variety of things among which the qualifications of the inspector is only one. Of the inspector himself he says, "The average physician is poorly equipped to do

medical inspection." He needs a special medical training and experience in the work. A study of the results of different inspectors in the Brooklyn schools showed that the inspectors varied from eighteen to one hundred per cent. as regards the number of the children needing treatment. Besides this, his success will depend on the co-operation of the school authorities and teachers, the employment of home visitors, nurses, free dispensaries, and on matters of organization of the work. A detailed description and discussion of the procedure in the actual work of medical inspection, taking up the different physical defects, diseases, organs and tissues, and mental deficiency follow. Nearly two hundred illustrations consisting of pictures, tables, curves, and numerous blanks and other illustrative material make the presentation concrete throughout. This is too detailed to review here. But we may note his discussion on mental deficiency. Mentally deficient children are defined as those who are "incapable of doing ordinary school work under fair conditions," and are divided into three groups: (1) Dull; (2) Border-land (real or apparent); (3) Feeble-minded. These classes are defined further. "Dull children are those who fail to do ordinary school work satisfactorily, but who are, nevertheless, normally intelligent in everyday words and action, and are not markedly peculiar." Most of these are permanently dull, a few become brilliant. "Border-land cases ('Backward children') are those so deficient intellectually that doubt exists whether to classify them as normal or feeble-minded." Psychologists and eugenists, who draw the line more closely, usually classify them as feeble-minded, while the ordinary observer and the average justice of the peace do not. "Feeble-minded persons are those with incurable mental deficiency of pronounced degree originating previous to adolescence, the intellectual development varying from zero to a scholastic ability to do fourth-grade work after unlimited teaching."

Special forms and grades of feeble-minded are discussed further. On the question of diagnosis of mental deficiency it is observed that "the only absolute evidence of mental deficiency is the expression of the child's thoughts by his words and actions." This is the direct evidence, but there is much indirect evidence, on which the author evidently lays much stress. This is as follows: "Indirect evidence (simply suggestive or corroborative) (1), bad heredity; (2) ill health (poor nutrition, anemia); (3) unfavorable environment; (4) physical defects of mild degree; (5) moderate retardation in school; (6) numerous physical defects indicating a generally faulty make-up. Semi-direct evidence (very suggestive or corroborative), (1) severe defects of sight or hearing; (2) organic brain disease; (3) marked retardation in physical and mental development during infancy (parents' statement); (4) marked retardation in school without good cause; (5) lack of emotional control; (6) defective neuro-muscular tone; (7) defective co-ordination."

Under the direct evidence is included, (1) "The child's school record; (2) systematic tests of the various mental processes; (3) tests of mental development (graded according to age) with more or less attempt at mind analysis." Several special mental tests are described, similar to many found

in psychological literature, but he does not give any data indicating the degree of correlation of their results with mental development. The Binet-Simon tests are given and criticized. The results with them give evidence of mental development but do not alone make a diagnosis. In fact, "a diagnosis, based entirely on the direct evidence, without a thought of ancestry, malnutrition, adenoids, home illiteracy, or foreign parentage, is unscientific and often wrong." The valuable features of the Binet-Simon tests are summarized in the following: "(1) They furnish a handy, quick, and fairly accurate method of testing a child's mentality; (2) they are serviceable to the ordinary grade teacher, the physician in general practice, and the parent, as they are simple and easily applied. The argumentative and doubting parent is quickly convinced when the child is tested according to an impersonal system, furnishing normal standards for each age; (3) from the third to the eighth years they not only present evidence, but go far towards making an immediate diagnosis; (4) after the eighth year they do not make a diagnosis because the variation within normal limits becomes too great, but they do present a good record of the child's present mentality." That the tests alone possess any superior merits over other means of diagnosis seems, however, not to be granted. For we read a little later that, "No special examiner who is honest claims anything more than a sound skill and judgment born of experience." A discussion of the results of mental deficiency, and the education and care of the mentally deficient closes this chapter. Next and finally are considered anomalies of the skeleton, nutrition, the skin, speech, infectious diseases, and prevalence of defects and diseases.

The book reflects throughout the extensive experience of the author in medical inspection, and it proceeds along concrete and practical lines. No medical inspector in the schools can afford to be without it. Necessarily, in a field so new, it is constructive and will, for this reason, undoubtedly arouse dissention on some points. The reviewer, for instance, would limit the scope of the medical inspector's duties to a much narrower range than the author does. If the work is properly organized, a condition which the medical inspector, however, rarely meets at the present time, he should be concerned with nothing but diagnosis and medical prescription. Further, if "the average physician is poorly equipped to do medical inspection" and needs a special training and experience, he is much more poorly equipped to make a mental diagnosis. Diagnosis of mental development had better be left to psychologists, at least if psychological methods are to be used. There is much material in the book which might have been omitted if the duties of the medical inspector had been more limited. This concerns largely matters of organization and administration, and especially the hundred pages on mental deficiency, including the discussion on their care and training. Perhaps also a different arrangement of the material might have avoided the necessity of discussing some of the same topics in each of the three sections of the book, thus giving a more orderly and compact presentation.

Faribault, Minnesota.

F. KUHLMANN.

The Kallikak Family. A Study in the Heredity of Feeble-Mindedness.
H. H. GODDARD, Ph. D. The Macmillan Co.

This is a book that should be studied by every adult who is interested in eugenics, and who is not? It is the story of two families descending from one man. One was the result of mating illicitly with a moron of high grade; and one was the result of a marriage with a woman of sound stock. The man known in the study as Martin Kallikak Sr., (a fictitious name) was himself descended from good stock. By his lapse from virtue, there came into being a son to whom the deserted mother gave the name of the father, and who is known in the study as Martin Kallikak Jr.

This son was the progenitor of a race of inefficients and of vicious people. His descendants in direct line number 480. Of these, 143 were feeble-minded, and only 46 known positively to be normal. The mental status of the rest is either unknown or doubtful. "Among these four hundred and eighty descendants, thirty-six have been illegitimate.

There have been thirty-three sexually immoral persons, mostly prostitutes.

There have been twenty-four confirmed alcoholics.

There have been three epileptics.

Eighty-two died in infancy.

Three were criminals.

Eight kept houses of illfame."

By marriage into other families there are known to the study and charted, a total of 1,146 related individuals, among whom there were 119 known to be feeble-minded in addition to the 143 in direct line.

On the other side, from the marriage with a woman of good family, there has descended in direct line, 496 people. In the whole number there were no mental defectives, only one insane (and that a case of religiosity, probably inherited from marriage into another family). Only three were in any sense degenerate, two of these being alcoholic, and one sexually immoral. This is a line of doctors, judges, educators, traders, land owners, in short respectable citizens, men and women prominent in every phase of social life. There were no epileptics, no illegitimate children, no immoral women and no criminals.

The pursuit of this study was favored by a chain of circumstances that enabled the field workers to secure unusually reliable and complete data. The parallelism of two descents from one common ancestor, makes the study one of the most enlightening and instructive contributions to heredity that has ever been made. The illustrations showing the housing conditions of some of the "bad" side, serve a good purpose in impressing upon the reader the nature of the usual environmental conditions in such cases, and into which such people always gravitate, and in which they always remain unless the stock is rehabilitated by the influx of better blood.

The photo of the young descendant from which the study started, and

the cuts representing hand work produced by her, with a description of her mental reactions to the laboratory tests, are well calculated to impress upon those unfamiliar with the moron grade, from which the bulk of all mental defectives come, the social and economic limitations of this class, despite their trained accomplishments in certain limited directions.

Dr. Goddard's contribution, in this work, to the study of mental defect, is epoch-making. He very properly pays a deserved tribute to Mr. Johnstone, his inspiration, Miss Kite the field-worker and Mr. Fels, his financial supporter, for their joint contributions to the success of the work.

A. C. ROGERS.



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JOURNAL OF PSYCHO-ASTHENICS

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THE BURDEN OF FEEBLE-MINDEDNESS*

BY DR. W. E. FERNALD

The methods of patient research and collective investigation which have led to such brilliant results in the study of various diseases in general medicine and surgery are now beginning to be applied to the study of the causation, extent, significance, treatment and prevention of feeble-mindedness—the synonym of human inefficiency and one of the great sources of human wretchedness and degradation.

The past few years have witnessed a striking awakening of professional and popular consciousness of the widespread prevalence of feeble-mindedness and its influence as a source of wretchedness to the patient himself and to his family, and as a causative factor in the production of crime, prostitution, pauperism, illegitimacy, intemperance and other complex social diseases.

The exact number of the feeble-minded in the community is not known. There are probably two to 1,000 of our population over 7,000 in Massachusetts alone. These cases are found in the families of the rich and of the poor, in the city and in the country. There is scarcely a village or a school district in my state where one or more will not be found. There is no reason for believing there is a greater proportion in my state than in other states or countries.

*This address, delivered before the Massachusetts Medical Society, as the "Annual Discourse," is essentially, though abbreviated, the same as the author's discussion at Vineland, before the American Association for the Study of the Feeble-Minded, June, 1912.

The fact that feeble-mindedness is the result of pathological conditions of the brain, either gross lesions caused by faulty development or by the destructive results of disease, or perhaps numerical deficiency or imperfect evolution of the ultimate cortical cells, makes it obvious that the resulting mental defect is incurable and permanent. If a nerve cell is damaged or destroyed by traumatism or disease, it is gone forever. It is never replaced by the multiplication of other similar cells, as may happen in other bodily tissues.

The various known causes of feeble-mindedness occur in two main groups—the hereditary and the accidental. The hereditary cases are those where the person is feeble-minded because his parents or other ancestors were feeble-minded. The accidental group includes those who are feeble-minded as a result of environmental causes, without hereditary influence.

The hereditary cases are the most numerous. The recent intensive study of the family histories of large numbers of the feeble-minded by Goddard, Davenport, and Tredgold show that, in at least eighty per cent. of these cases, the mental defect had been preceded by other cases of defect in the immediate family line. Goddard finds that sixty-five per cent. of his institution cases had one or both parents actually feeble-minded. It is believed that this hereditary defect is the result of protoplasmic defect in the germ plasm of the family stock.

There is no doubt as to the potency and certainty of this hereditary tendency. Often the feeble-minded child represents a feeble-minded family. Davenport believes that aside from the Mongolian type, probably no imbecile is born except of parents who, if not mentally defective themselves, both carry mental defect in their germ plasm.

So far as is known, if both parents are feeble-minded, all the offspring will be feeble-minded. If one parent is feeble-minded, it is probable that some of the offspring will be feeble-minded, and the children who are themselves normal will be likely to beget defectives. These normal persons in tainted families who are potential “carriers” of the defective germ plasm may keep up the sequence. If both parents come from tainted

families, the probability of defect in the children is much increased. The normal members of tainted families who mate with healthy individuals with no family taint are not so likely to have defective children; indeed, the tendency may be eradicated by judicious breeding-up for several generations. This tendency may be expressed by one or more cases in every generation, or it may skip one generation to reappear in the next. Inheritance is not merely a question of fathers and mothers, but the family tree goes farther back.

Among the probable accidental or environmental causes of feeble-mindedness are injuries to the head at birth, blows or falls in infancy, inflammatory brain disease, toxemia from infectious diseases, abnormal mental or physical conditions of the parents, etc., or the absence of certain vital substances from the blood, as in cretinism. Cases of feeble-mindedness often occur in families where there has been no mental disease or defect for several generations. But even where the exciting cause is undoubtedly accidental, there is often a strong hereditary predisposition. Similar injuries or causes in sound families do not result in feeble-mindedness. In the majority of these cases the environmental causes are only accessory. The real origin of the disease lies in the defect of the germ plasm.

Certain types of defect are usually if not always due to accidental or sporadic causes, viz., the Mongolian, hydrocephalic, post-meningitic, the cerebral hemorrhagic, etc. Acquired characteristics are not likely to be transmitted, but there is reason for the belief that alcoholism, syphilis, tuberculosis and other environmental factors may initiate germinal variation which may become hereditary. The cases of purely accidental origin with no morbid heredity are not likely to be followed by other cases in that family. The purely accidental cases themselves would probably beget normal progeny.

To sum up, there is a large number of feeble-minded persons in our community. The great majority of these persons are feeble-minded because they come from a stock which transmits feeble-mindedness from generation to generation in accordance with the laws of heredity. Many of the members of these fam-

ilies are not defective themselves, but to a certain extent these normal members of tainted families are liable to have a certain number of defectives among their own descendants.

There is a popular belief that feeble-mindedness is greatly on the increase. We do not know, and are not likely to know, whether or not there is now relatively more feeble-mindedness than there was fifty or one hundred or five hundred years ago. There is some reason for the belief that the remarkable shift of population from rural to urban conditions in the last half-century, with the resulting industrial and social stress, and a greater liability to syphilis, tuberculosis and alcoholism, has increased the ratio of defectives in the families with hereditary predisposition. It is certain that the feeble-minded girl or woman in the city rarely escapes the sexual experiences that too often result in the birth of more defectives and degenerates. At the same time the steady withdrawal of the more sturdy and virile individuals from the country to the towns leaves the ineffective and defective men and women in the country to marry and beget offspring even less efficient than themselves. Recent study of certain isolated rural communities in Massachusetts where the more vigorous families have migrated for several generations, shows a marked deterioration in the quality of the population, with a large number of the feeble-minded and a notable amount of immorality, intemperance and shiftlessness. The defective persons in these communities are very apt to be attracted to each other, and to marry or to intermarry, thus intensifying the degenerative process. The members of this society are only too familiar with these rural foci of feeble-mindedness, immorality, crime and destitution.

The social and economic burdens of uncomplicated feeble-mindedness are only too well known. The feeble-minded are a parasitic, predatory class, never capable of self-support or of managing their own affairs. The great majority ultimately become public charges in some form. They cause unutterable sorrow at home and are a menace and danger to the community. Feeble-minded women are almost invariably immoral, and if at large usually become carriers of venereal disease or give birth

to children who are as defective as themselves. The feeble-minded woman who marries is twice as prolific as the normal woman.

We have only begun to understand the importance of feeble-mindedness as a factor in the causation of pauperism, crime and other social problems. Hereditary pauperism, or pauperism of two or more generations of the same family, generally means hereditary feeble-mindedness. In Massachusetts there are families who have been paupers for many generations. Some of the members were born or even conceived in the poorhouse.

Every feeble-minded person, especially the high-grade imbecile, is a potential criminal, needing only the proper environment and opportunity for the development and expression of his criminal tendencies. The unrecognized imbecile is a most dangerous element in the community. There are many crimes committed by imbeciles for every one committed by an insane person. The average prison population includes more imbeciles than lunatics. The term "defective delinquent" is applied to this special class of defectives where the mental lack is relatively slight, though unmistakable, and the criminal tendencies are marked and constant.

At least twenty-five per cent. of the inmates of our penal institutions are mentally defective and belong either to the feeble-minded or to the defective delinquent class. Nearly fifty per cent. of the girls at the Lancaster reformatory are mentally defective. The class of defective delinquents of both sexes is well known in every police court, jail, reformatory and prison. There is a close analogy between the defective delinquent and the instinctive criminals who form a large proportion of the prison rounder type. Under present conditions these irresponsible persons are discharged at the expiration of their sentences to lay tribute on the community, to reproduce their own kind, to be returned to prison again and again.

A very large proportion of the neglected and dependent children in the care of the State are feeble-minded and are the offspring of the feeble-minded.

Many of the immoral and diseased girls found in rescue

homes and shelters are defective and absolutely incapable of reform or of self-support. Many prostitutes are mentally defective. A large proportion of the mothers of illegitimate children at Tewksbury and elsewhere are feeble-minded. In one county almshouse in Pennsylvania there were 105 mothers of illegitimate children, and of these mothers one hundred were feeble-minded. A majority of the parents prosecuted by the Society for the Prevention of Cruelty to Children for abuse of their own children are feeble-minded. In England seventy per cent. of the habitual drunkards who are dealt with under the Inebriate Act are mentally defective.

The modern intensive study of the family trees of individual degenerates, the insane, epileptics, criminals, prostitutes, hereditary paupers and feeble-minded has emphasized the fact that these various conditions of degeneracy are often merely different phases or expressions of the same fundamental inferiority. In these degenerate families the form of defect varies from generation to generation, feeble-mindedness in one generation, pauperism or criminality in the next, and then some form of insanity, alcoholism, etc.

It has been truly said that feeble-mindedness is the mother of crime, pauperism and degeneracy. It is certain that the feeble-minded and the progeny of the feeble-minded constitute one of the great social and economic burdens of modern times.

The realization of these truths and the recognition of the strong tendency to hereditary transmission has produced a sort of panic on the part of those who have just learned of these facts. Visions of a feeble-minded peril in future generations are seen, and have resulted in a "wild panic for instant action." There is no occasion for hysterical, ill-considered action.

It is probable that intelligent study of the whole problem on a large scale will furnish data for adequate treatment and control. The full problem should be stated by a complete and permanent census of the feeble-minded of the entire State. This is possible by the co-operation of physicians, teachers, social workers, court and prison officials, local authorities, etc. Such registration would be analogous to the required notification and

registration of contagious and infectious diseases, and would be the first step in the regulation and elimination of defective strains from the community. The Massachusetts State Board of Insanity has already begun an informal and tentative census of this sort.

In the light of our present knowledge, the only way to reduce the number of the feeble-minded is to prevent their birth. The perpetuation of defective family stocks should be inhibited. This would be possible to a great extent if every feeble-minded person and potential "carrier" of the defective germ plasm could be prevented from parenthood.

There is already a strong popular demand for the logical and thorough application of our present knowledge of the laws of morbid heredity in the way of prevention. Massachusetts has begun the policy of the segregation of the feeble-minded, especially those of childbearing age. This segregation carried on thoroughly for a generation would largely reduce the amount of feeble-mindedness. The high-grade female imbecile group is the most dangerous class. They are not capable of becoming desirable or safe members of the community. They are never able to support themselves. They are certain to become sexual offenders and to spread venereal disease or to give birth to degenerate children. Their numerous progeny usually become public charges as diseased or neglected children, imbeciles, epileptics, juvenile delinquents or later on as adult paupers or criminals. The segregation of this class should be rapidly extended until all not adequately guarded at home are placed under strict sexual quarantine. Hundreds of known cases of this sort are now at large because the institutions are overcrowded.

Only 2,000 feeble-minded persons are now cared for in institutions in Massachusetts, and over 1,000 applicants are awaiting admission to the institutions. There is an urgent demand for greatly increased institutional provision for this class. The cost of this provision will be great, but not as great as the present cost of caring for these same persons, to say **nothing** of their progeny, in future generations. It would cost less money, be more economical in social life and of immense value morally.

These people are never self-supporting, but are eventually supported by the public in some way. From the economic standpoint alone no other investment could be so profitable, not even in canals or railroad or factories. The present generation is the trustee for the inherent quality as well as for the material welfare of future generations.

In a few years the expense of institutions and farm colonies for the feeble-minded will be counterbalanced by the reduction in the population of almshouses, prisons and other expensive institutions. When the feeble-minded are recognized in childhood and trained properly, many of them are capable of being supported at low cost under institution supervision.

Not that we regard the institution as the panacea for feeble-mindedness. If adequate institution provision were available to-day, it would not be feasible to secure the detention of large numbers of defectives, and those the most dangerous class, where parents or friends are unable or unwilling to see the necessity for such segregation. We have no laws compelling this action. The Anglo-Saxon respect for the liberty of the individual would make it difficult to enact laws compelling such custody. This difficulty could be approached by the suggested registration of the feeble-minded which would afford a basis for some sort of extra-institutional supervision and control. The observed misconduct and incapacity of many of these people would soon show the need of legal provision for their forcible segregation.

In a rational policy for controlling feeble-mindedness it is essential that we recognize the condition in childhood. Our compulsory school laws bring every child to official notice. Every case of feeble-mindedness should be recorded. At the proper time the parents should be informed of the condition of the child, of the necessity for life long supervision and of the probable need of institution treatment. Sooner or later the parents will probably be willing to allow their child to be cared for in the institution. The parents who are not willing should be allowed the custody of their child, with the understanding that he shall be properly cared and provided for during his life, that he shall not be allowed to get into mischief and that he shall be prevent-

ed from parenthood. Whenever the parents or friends are unwilling or incapable of performing these duties, the law should provide that the child shall be forcibly placed in an institution, or otherwise legally supervised.

There are now special public-school classes for the feeble-minded in most of our cities and large towns. These classes insure diagnosis and treatment at an early age, they help to inform the parents as to the dangers of the condition and they admirably serve as clearing houses for permanent segregation before adult life is reached. They should be extended and increased in number.

The mental defectives in our penal institutions should be recognized and transferred to permanent custody in suitable institutions and farm colonies and not discharged at the expiration of their sentences, to beget other defectives and to re-enter their careers of crime. We now have a law in Massachusetts authorizing the permanent control and custody of this criminal imbecile class which only needs the provision of suitable buildings to become effective. No other state or country has yet made similar legal recognition of these so-called defective delinquents. The logical application of this law would materially modify our present methods of dealing with certain classes of so-called "criminals" in the prisons, jails, reform schools and the courts. The elimination of these defectives from the prisons would increase the opportunities for reforming the normal offenders who are really capable of reform.

Compulsory surgical sterilization of all defectives is proposed as a radical method for preventing the hereditary transmission of feeble-mindedness. At least six states have passed laws authorizing or requiring this operation. In no state, however, has this remedy been applied on a large scale. There are many objections to this plan. The friends of the patients are not willing to have the operation performed. The normal "carriers" of defect would not be affected. The presence of these sterile people in the community, with unimpaired sexual desire and capacity would be direct encouragement of vice and a prolific source

of venereal disease. Sterilization would not be a safe and effective substitute for permanent segregation and control.

It is probable that education in the broadest sense will be the most effective method in a rational movement for the diminution of feeble-mindedness. The public generally should be intelligently informed as to the extent, causation and significance by means of suitable literature, popular lectures and other means. There is now great demand for such information from women's clubs, church societies, charitable organizations, etc. General knowledge of this subject in a community will insure the rational protection and control of the feeble-minded persons in that community.

The principles of heredity, as they are unfolded, and especially of morbid heredity, should be taught in the colleges, the normal schools, and, indeed, in the high schools. The adolescent has a right to be informed on a subject which is of supreme importance to himself, to his family and to his descendants. The great majority of these young people will later marry and become parents. The dangers of a marriage with persons of diseased stock should be presented plainly. The young woman about to marry should be taught that her most important duty to herself and to her race is to choose a man of good heredity as the father of her children. The young man should be taught that the quality of the family stock of his future wife largely determines the health and efficiency and sanity of his children, and of his children's children. Those who have been privileged to address groups of young people on these subjects can but be deeply impressed with the breathless interest and appreciative understanding of their auditors.

The biological, economic and sociological bearings of feeble-mindedness have overshadowed the fact that it is fundamentally and essentially a medical question. This subject should receive more attention in the medical schools. At the present time only a few schools in this country give any instruction whatever in the subject. General hospitals and dispensaries should have out-patient departments for the diagnosis and treatment of feeble-mindedness. These clinics would also provide for the in-

struction of students. No medical student should graduate until he has a general knowledge of the causes, varieties, prognosis and treatment of feeble-mindedness.

Every physician in general practice will find cases of feeble-mindedness among his patients. He has the unwelcome task of informing the parents of the misfortune of their child. He is called upon to advise as to treatment and life-long care and protection.

The prevention of the accidental type of feeble-mindedness largely depends upon the knowledge and skill of the physician in recognizing and in removing or modifying the environmental conditions which may cause the defect.

The recognized field of mental defect has been gradually extended and widened, and clinical types and degrees of feeble-mindedness are recognized by the alienist which are not yet familiar to the medical profession generally. It is most important that the physician should recognize the so-called "border-line" cases, where the intellectual defect is apparently slight, and is overshadowed by the immoral and criminal tendencies. These cases may be glib and plausible, often bright-looking and attractive, but are unable to apply themselves at school or at work without constant supervision, and are wholly indifferent to the consequences of their behavior and actions. The inability to get or keep a situation or to support themselves is most significant. These cases often present a bad family history, a personal history showing backwardness in infancy and school life, and the presence of various physical stigmata of feeble-mindedness. Psychological tests of these adolescents or adults show that they have a mental age of only seven or eight or nine years. In fact, they are cases of real feeble-mindedness differing only in degree and not in kind from the more obvious varieties.

The growing appreciation of the medico-legal bearings of feeble-mindedness, the increasing tendency of the courts to inquire into the mental status of persons accused of crime, and the widespread movement to recognize and treat mental defect in the public schools have created an urgent demand for the services of physicians skilled in the diagnosis of mental defect which

cannot be met at the present time. Indeed, the social worker, the charity visitor, the teacher and the court official often recognize cases of feeble-mindedness which they are unable to properly treat and control because they cannot secure the co-operation of suitably qualified physicians. A medical diagnosis of feeble-mindedness is necessary before a case can be properly or legally considered.

If, as we believe, the prevalence of feeble-mindedness can be most effectively reduced by educational methods, the remedy largely depends upon the medical profession. The physician has knowledge of family histories and tendencies. He has access to family councils. His advice in individual cases is eagerly sought and generally followed. He has exclusive opportunity to teach and inculcate certain accepted principles of practical eugenics.

The most important point is that feeble-mindedness is highly hereditary, and that each feeble-minded person is a potential source of an endless progeny of defect. No feeble-minded person should be allowed to marry, or to become a parent. The feeble-minded should be guarded or segregated during the child-bearing period.

The normal members of a definitely tainted family may transmit defect to their own children, especially if they mate with one with similar hereditary tendencies. These potential carriers of defect should mate with sound stock, if they marry at all. If the hereditary tendency is marked and persistent, the normal members of the family should not marry. Certain families should become extinct. Parenthood is not for all.

Persons of good heredity run a risk of entailing defect upon their descendants when they marry into a family with this hereditary taint. Intelligent people are often willing to forego a proposed marriage if the possibilities of heredity are fully understood. The immediate sacrifice is less painful than the future devoted to the hopeless care of feeble-minded children. What can be more tragic than the familiar cry of the agonized mother, "If I had only known?"

The well-informed physician has the pleasant privilege of

allaying the fears of those who misinterpret and magnify the possibilities of morbid heredity in their own families. It should be remembered that a single case of defect of accidental origin, with no hereditary tendency, is not likely to be followed by other cases in the same family. Indeed, a case of this sort may be found in a family where the other members are of exceptionally brilliant and gifted mentality. The ordinary family is safe and sound and whole, and is extremely unlikely to produce feeble-minded children.

In the annual discourse for 1907 Dr. Adams said: "A medical practitioner is, to a greater or less extent, a missionary. He is always finding and doing some work, unpaid or underpaid, for his fellowmen, because his training and his position make such work possible and natural. In all philanthropic measures he is to be relied upon as a helper, and in those pertaining to public health he is naturally a leader. He has unequalled facilities for disseminating knowledge, for awakening interest and for guiding benevolence. The evidences of this influence are to be seen on every hand."

The imminent problem of dealing effectively with this burden of feeble-mindedness presents a fertile and pertinent field for the exercise of these extra professional activities and obligations of the medical practitioner. The community looks to him for education and guidance on this subject. Concerted action by the medical profession will surely create the strong public sentiment which will demand a prompt and effective plan for the proper care of all the feeble-minded, and for the elimination of feeble-mindedness so far as that is possible.

DISCUSSION

Dr. Charles Bernstein: Mr. Chairman, this paper of Dr. Fernald's has been very instructive to all of us and he has very carefully covered the subject of feeble-mindedness, especially borderline feeble-mindedness. I am more than glad to have two or three of our managers here today. I don't know of any better place that I could have brought them to get the bene-

fit of this matter. In New York State at the present time under the auspices of the State Charities' Aid Association there exists a position as County Agent. There are about twenty, I think, of these agents in New York State at the present time. They originally had only the placing out of children from the orphan asylum. Then they found children who should not be placed out. They wanted to know whether they were normal or abnormal and they have asked us to take them. They were committed to us originally as feeble-minded, which we felt was very wrong. If they were not feeble-minded they should not have had that stigma attached to them. As a result the legislature last year passed a law, giving us power to take these cases, as they say, voluntarily for the purpose of examination to see whether they are feeble-minded or not, thus avoiding the stigma of committment when there is doubt as to diagnosis. We have only operated under the law a couple of months, though we have operated in a measure under the theory of it for a couple of years. I am more and more convinced that we must have these cases for a year to know them and to determine whether they are feeble-minded or not. Of course we know we have no laboratory test to help us with certainty in these borderline cases today. Just at the present time we are facing the question what to do with these borderline cases which have already been committed to us and who, we feel, are not actually feeble-minded. Are we to let them go? Are we to have a placing-out system or to hold them in the institution? They have committed no crime. They have done nothing to warrant our holding them there indefinitely for fear they may do something. Three cases have been refused and this action the courts have sustained.

I have been interested in the matter of placing out boys and I have been trying to convince our managers of the advantage of that for a year or more. One of them heard something about the Kentucky system, and thought it was pretty fine in the way in which it worked out. As I understand it, under the Kentucky system the parent of the feeble-minded child (Dr. Rogers will correct me if I am wrong) is said to take care of it. I would not recommend that. We propose to do as Dr. Fernald has done,

let these boys go out on the farm. We know the difficulty in New York of finding labor, and the farmers are very much in need of this class of laborers. We have a few boys out at the present time and I would like to see more of them placed out. I don't know but what I would like to see some of the girls sent out if the families could be well picked and we could have a supervision over them.

Then another matter that I was glad to hear Dr. Fernald discuss is that of sterilization. The very cases which most need to be sterilized can never be reached. Therefore, the place for them is in the institution or on the farm; but on the other hand, in our experience in placing these boys out, I have had three or four come back in the last few months with infectious and social diseases. Of course they did not have proper supervision, though we have picked out families very carefully. Two or three boys work in the mills and they have the privilege of coming back and seeing the entertainment every Friday. These boys have money that they have saved and placed in the saving bank, but the danger from social diseases makes their employment in the country advisable instead of in the city. Those that we have in the country are the ones that are getting along the best.

Now for the purpose of finding these borderline cases in the community, that is, these cases which ordinarily do not come under the action of the law, the present legislature in New York State has this year created a Bureau of Analysis and Investigation under the State Board of Charities. The first thing they will attempt to do is to correlate family names in the prisons, charities and insanity departments. Then they will send their agents out in the community to find the actual conditions, which action certainly looks very promising.

Dr. Fernald refers to two other very important points, the matter of educating the public concerning the nature of feeble-mindedness and expert advice concerning the possibility of other children being defective, when one such has been born into any given family. The former is very important. In regard to the latter, I have been consulted in several cases and in this connection I would like to ask for information on one thing in ani-

mal breeding whether there is anything in the literature of human breeding confirming it. I refer to the notion prevalent among animal breeders that the first offspring will be defective.

Mr. Van Wagenen: Professor Raymond Pearl has lately written a paper which I have on this subject, making some observations from his studies of animal breeding in regard to the question of sterilization. Looking at this matter simply from the scientific and eugenic point of view, any person who is defective, or in whose family, within two generations prior there is known to be one or more defective or insane, should not be permitted to procreate. Any person having one defective child, as soon as the fact becomes known, should not be permitted to procreate any further. He derives these conclusions from his experience in animal breeding.

Dr. H. H. Goddard: Pearson says that the child labor laws in England which resulted in reduction of the size of the families, worked great injustice because the first and second children are inferior, and, exactly as you said, the third, fourth and fifth would have been brighter. Now that the size of the families has been reduced the value of the population has been reduced because the best children have been cut off.

Dr. Bernstein: In three instances, based on my interpretation of the subject and based on my understanding of animal breeding, for I have known of a great many breeders of horses and cattle who didn't think of keeping the first offspring as a part of their fancy stock—where I couldn't trace any bad heredity within a generation or two, I have advised them to take the chance of having a second child. In one instance it was normal, and in one instance they took no chance. They were particularly interested in having us know the facts and they wanted information on the subject. The mere fact that they had begotten one feeble-minded child at first and there was no marked heredity in the family, did not seem to me to warrant their being deprived of the privilege of having a family.

Dr. Little: Mr. President, coming to the concrete question of placing out in homes, the defective delinquent and the high grade imbecile, the Doctor I know has been advocating

that in New York State. As you know there has been a movement going over the state of New York this last year to spread the knowledge of feeble-mindedness, but I think we are defeating our own purposes to some extent when some of us take the position that the feeble-minded and the defective delinquent and that higher group should be permanently placed in an institution, and some of us even think that they ought to be placed out in homes. I personally, without any experience in the matter, am opposed to the proposition of placing out in homes any one who has been adjudged a defective delinquent or feeble-minded. It is difficult enough to place in homes normal children, to find satisfactory places for them, and I haven't any faith that the defective delinquent or the feeble-minded will become a success to himself or herself or to the community and that there is no use of agitating a proposition that is bound to fail.

Miss Grace Boehne: Mr. President, may I ask Dr. Bernstein if he looks into the previous record of the child, the record which has caused the committment of this child to the institution? We have been taught to believe that the high grade morons are quite normal in a way and can do fairly good work if they are under proper supervision, and does not that in many cases bias you in your judgment of the defective child? Would it not be a very advisable thing to get from the person who has committed the child, the previous record of the child's conduct? I know in several of the cases I have been able to persuade children to go to the institutions, the parents were perfectly willing to have them go because they had been taken into court many, many times, and besides, the children had failed utterly in the schoolroom. In one case, not at Dr. Bernstein's institution, the child was left in an institution for a year, and the report came back to me that the child was normal and we were severely criticised for having sent the child to an institution. Now I know definitely that there are two other children in the same family who are defectives. We have had one other child in special classes that has been an entire failure during his entire school experience. This boy, Frank, was continually in trouble, but he was sent from the institution as a normal child and put to

work. He made a failure on the farm to where he was sent and belongs to a special class at the present time, though he has had to leave school because of his bad physical condition. Furthermore, another feeble-minded child in the family will be placed in the special classes as soon as she enters the public schools. Now will it not be to our advantage to use the experience we had with the child in the institution in taking care of this one about to enter the schools, or to consider the experience of the workers with the child at large? Now with reference to placing these children on farms throughout the state. It has been my experience that there are many parents who are unwilling to have their children placed in an institution, yet we have got to place them where we can feel that they will be cared for properly. When a child can be committed to an institution and placed in custody and there is no doubt as to the defect, isn't it going to be a wise plan to continue that child's custody? It has been my experience, too, that unless we are very very careful to have a social worker follow up these cases who are placed on the farms, the children are very much overworked. The farmer does not understand the condition many times, and I know of one instance where the child's health was seriously impaired. He had to be taken from the farm and sent to a sanitarium to recuperate his health.

Mr. Von Wagenen: I would like to sound a note of warning in addition to that last statement in regard to placing high grade feeble-minded children out on farms. I have personal knowledge enough, I think, to make it proper for me to say that there is the greatest risk in placing these children out in that way on farms. There may be here and there a farmer who is in a position, both as to intelligence and affluence, to take an interest in the feeble-minded child and do for him or her as a child ought to be done by, but I am sure that he is the exception and that to attempt to dispose of any number of feeble-minded children in that way will be running the greatest risk to the individual child and furthermore to the continuance of the same type. Again, I assure you from my knowledge of rural life, that while there is less of actual immorality because there are fewer peo-

ple, there is no less relatively, of immorality in the country than there is in the most densely populated part of the great cities. Some of the vilest places you can find are right in the hills of New England, and these children would be exposed, I am sure, to such things and without having in the great majority of cases any sufficient protection.

Dr. Bernstein: Mr. President, you cannot work those boys too hard. If they work them as hard as they can they will not practice the vices to which the gentleman alludes. Let them go out and work just as hard as they will work. That is what they have to do for me when they work on the farm. They work so that when they come in at night they go to bed and sleep. Then they get up the next morning and go to work again, and I am very sure that the farmers who are working them the hardest are keeping them the best in line of good behavior. Miss Boehne suggests that the boy was overworked. Of course, we know that there are some tubercular conditions among the feeble-minded, that should be considered. About half of our population are subject to these same conditions.

Dr. Murdoch: Mr. President, in regard to the defective delinquent, we know that this type requires a closer supervision and care than the ordinary feeble-minded child. We cannot allow the same amount of liberty to the defective delinquent that we can to our ordinary simple feeble-minded and imbecile. Now what are we going to do with them? Are we going to take care of them in our institutions for feeble-minded in special departments or are we going to take care of them in the institutions for delinquents, the reformatories, or are we going to have separate institutions for this particular class? I am somewhat in doubt as to the best practice but I think that this matter has been carefully considered in Massachusetts and I would like to hear from Dr. Fernald on this point.

Dr. Emerick: Possibly we do not all have the magnetic influence to keep in touch with these children who are farmed out that Dr. Fernald has, and it is possible that other states have not the environment Massachusetts has to put them in. Our experience in placing out has been anything but good. One

of the first cases that came to my attention after going to the institution was that of one of our girls who was taken by one of the trustees into a home where the associations were of the very best. She soon drifted away and he said he would never try the experiment again. A former superintendent when he left took a little girl with him into a modern home. She was left alone at the house one day and one of the neighboring boys assaulted her. Of course, they never left her alone again. I let one of our boys go out and in sixty days he was married. I let another one out and he wound up in the police station. Another boy I call to mind went out with a very good farmer and an ex-school teacher, a very intelligent and well-meaning man, but the boy has gone to the dogs. My experience has been so universally unfavorable in this matter and realizing as I do that these morons are the most dangerous ones—that is, most prolific of any—that I am very much opposed to placing them out.

Dr. Wallace: Mr. President, not to help Dr. Bernstein, because I know that he does not need it, but with this great wave of education sweeping over the land on one side, and with the great dearth of information that the members of the medical profession, and those who commit these people have upon the subject of feeble-mindedness on the other, I think that we have some reason to use a little discretion in the institutions. I don't know how it is in the other states but I know that in Massachusetts it has become too easy a matter to get a child into an institution for the feeble-minded and I do not believe we who are at the head of institutions can idly sit by and allow children to be railroaded into our institutions regardless of their mental condition simply because they have been a little wayward; many of them orphans; many of them without a mother's love and care. An appreciable number, probably the same ones that Dr. Fernald has placed out successfully, had they had mother's care and a mother's guidance could have been prevented from ever acquiring the stigma of entering an institution for the feeble-minded. I do heartily believe that there is a good deal to be said on this side. With the social workers pressing the physicians and the physicians too ignorant of the conditions, there is

a likelihood of error, and I know that there is error in commitment. Isn't the time ripe for requiring the judgment of some one who is familiar with feeble-minded conditions and feeble-minded children, to pass upon the cases before they come to the institution, or for allowing us in the institutions to use a little latitude. I believe that the time is ripe for this association to make some move towards framing legislation requiring competent judges to pass on children before they are admitted into an institution. The institution is becoming too popular. The school physicians in our big cities, even those who know feeble-minded children, and feeble-minded classes, because of the pressure that is brought to bear on them from the teachers, because the latter do not understand certain children, are often influenced in passing upon these brighter individuals by deferring to the opinion of the teachers who have had the best opportunity to observe them. I know this to be a fact. A boy, because he does some little foolish thing that the rest of us have done but escaped public censure because we had mothers and fathers to look after us, is passed up as feeble-minded and sent to the institution. We want to keep out of institutions all who don't belong there. I don't believe that the community wants to shirk its responsibility in that way.

Dr. Downing: Mr. President, referring to borderline cases, I have a child with respect to whom it is a question whether he is feeble-minded or not. Because of an accident it was thought best to have an X-Ray picture taken of his hand. The examination showed the too early ossification of the carpal bones. In hunting over the literature I found that two men in New York had published a report on defective children, mostly at Randall's Island, where they found the carpal bones and hand bones were not alike in their ossification. I find in every case so far of my own, and I have taken children from two and a half to twelve years, this same condition of the carpal and hand bones.

Dr. Rogers: As to the advisability of placing out feeble-minded children, there can, I think, be no question concerning the wise course to pursue in regard to all who are definitely de-

fective mentally, and we should be careful not to confuse the issue. The very conditions that render the existence of institutions for feeble-minded necessary, as custodial homes in the broad general sense, contraindicate the probability of placing out mental defectives, successfully. Of course, if now and then a child that is not mentally defective is committed or admitted to an institution, even though such a child is retarded in mental growth from some remedial cause, such a child should have a home in a good family as soon as one can be found for him. Again, a high grade moron boy of acquired mental defect, might be a very safe case to place out in a good family, though the good families that are willing to take such a person, give him a good home, be responsible for his keep, health, comfort, and conduct for what he can earn the year around, are in our northwest, at least, very rarely found.

We have occasionally found such a family, though in most instances even then the arrangements with them has not been of long duration. The boy has generally become unmanageable or has resented what he deemed to be insufficient compensation for services rendered and has returned to the institution or drifted into a more or less precarious method of securing a livelihood. We have a few boys in Minnesota who have gone out and are doing well, but the number is small, comparatively.

We have never deliberately placed out but two girls, both under exceptionally good circumstances and with former teachers. In one case the temperament of the girl and the very close home influence have combined to secure to her a happy and contented life. In the other case, the temperament and personal attractiveness of the girl and the indiscreet freedom permitted, resulted in the usual fall. Except as first stated, I have always discouraged the sending out of girls, but some have gone out against my judgment and their careers have not been satisfactory.

Dr. Keating: Before Dr. Fernald closes the discussion, I would like to revert to one point and that is the education of the public. The teachers in Baltimore, through the influence of Dr. Huey have been giving lectures to the children on the ef-

fects of feeble-mindedness. We are familiar with the educational talks about the effects of tuberculosis and alcoholism but there has been nothing said about the nature of feeble-mindedness and the effect on the offspring. The teachings of these teachers are having a splendid effect, and we have been able to retain several children in the institution through the efforts of the teachers. I can't agree with Dr. Bernstein that it would take too long to wait for the effect of educational work. The children of today will be the heads of families tomorrow and I think it pays to educate the coming generation in regard to these very things. I hope the superintendents will never lose an opportunity to tell teachers about the effect of feeble-mindedness. Tell it to the children also and explain it to them in an explicit way, and they will think about it and it will bear abundant fruit.

Dr. Bernstein: I would like to know the age of those children you talked to.

Dr. Keating: The children I have spoken to are from fourteen to sixteen years of age.

Dr. Fernald: Mr. Chairman, I am afraid that my paper was not thoroughly understood because I tried to emphasize the importance of two points. First, that education in the broadest sense must be our chief weapon. We must educate the law-maker; we must educate the judges, the doctors, the teachers. We must educate the children who go to the high school, and college, and normal school, and the medical student. We can thus leaven the population and they will spread the information to the rest of the public who are capable of being educated. We may deal with the other half of the community by our segregation and our sterilization propositions, or by other means. We all understand that laws on our statute books providing for the segregation and sterilization of the defective will be of no value unless the public is educated to demand an enforcement of them. The states in the Union which are successfully handling this matter, are the states where an intelligent campaign of education has been carried on for more than a generation.

The second point on which I seem to have been misunder-

stood relates to placing out. I am sure I don't want to be quoted as placing out feeble-minded boys and girls because I never intended to advocate any such principle. The cases which we have out on parole are morons who have been, say, trained and educated so that they seem very much like normal people. It is a question as to whether we should allow their parents to take them out for we want to keep a legal hold on them and give them a bit of supervision. We either have the choice of doing that or allowing them to be discharged and losing control. By the parole, we have a string on them. I believe that these persons would be better off in the institution but if we kept those forty patients, I think we would be violating the public sentiment of at least forty communities, and I think the presence of the feeble-minded people in the community in this way serves an educational purpose. I think there is a possibility that we may carry this segregation work so far and do our work so well that in a generation or two people would forget our teaching. So I think that the cases that can be returned to the community under proper parole restrictions are in a way, wholesome object lessons. They serve to prevent the community from forgetting. These boys who have gone out, with two exceptions, are city boys, because we deal almost entirely with the urban or town population, collected from manufacturing towns. I agree with the speaker who referred to the immorality of the country town. I think that the feeble-minded boy who is brought up in the city with city traditions in his blood is very unhappy on a farm. I think that the theory that the farm is necessarily good for people who are defective or criminal is open to a good deal of criticism. Placing-out agents from the reform schools for boys tell us that many boys who are happy, contented and do well in cities, being city bred and having the traditions of city life, will be perfectly lazy out with the trees.

There is a faction in Massachusetts who believe that the institution for feeble-minded ought to care for the defective delinquent. The first application of the new law will be a re-classification of the people now in the penal institutions. This merely means a separation of the mentally defective prisoners from the

normal ones. It seems to be a good tentative method which promises growth and can be modified as found necessary. The defective delinquents are an incorrigible, troublesome class. They are not amenable to the altruistic principles which we see around us here. The ordinary defective delinquent in Vineland would co-operate with some of your customs and traditions, but if you had many, especially those who had criminal experiences, I don't think you could handle them. There is a very large class of these defectives. Any state with a population large enough to maintain an institution for the feeble-minded, would have a very large class of the type of feeble-minded who properly classify as defective delinquents. Some of them are very desperate and determined people. The mere prevention of escape is to them often a serious matter. The medico-legal significance of feeble-mindedness we have only begun to study. We have institutions for insane criminals, and yet there are probably five imbecile criminals to one insane criminal. The imbecile is by his very nature susceptible to criminal influence. Probably no paper on the feeble-minded is read without that fact being stated and yet up to this time we have made absolutely no provision for the differentiation of this class from other criminals.

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EDITOR

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REVIEWS AND NOTICES

Ueber Intelligenzpruefungen (nach der Methode von Binet und Simon). O. BOBERTAG, *Zeitschrift fuer angewandte Psychologie*, 1912.

This is the second of the author's articles giving the results of his study of the Binet-Simon tests in examining public school children. The first dealt with matters of his method of work and the analysis and accuracy of individual tests. The present article deals with the accuracy of the tests as a whole and with certain theoretical considerations underlying the same. Two of the basic assumptions of Binet and Simon are that the number of children who are mentally retarded according to the tests shall equal the number that are advanced, and that the majority shall test out at age, if the tests are to measure the mental age correctly. These two demands seem very

plausible on *a priori* grounds. But Binet has nowhere attempted to find what theoretical explanation might be given to show that they are correct. The author tests them out. In the first place he notes that the empirical results taken on the whole very closely approximate fulfillment of the former demand. Binet and Simon give three tables, one in 1908 and two in 1911, and the author has results from 261 children on this point. This shows the following:

	Retarded	At Age	Advanced
Binet and Simon.....	28%	48%	23%
Bobertag	23%	51%	25%

But this favorable result is obtained only when the results for all ages are taken together. When each chronological age is considered separately the equality of the number of retarded and advanced disappears almost entirely. Up to the eighth year the advanced exceeds the retarded in number. From the ninth year on the retarded exceeds the advanced. The favorable showing of the mass results is merely an accident. The tests are as a matter of fact not of the proper degree of difficulty in all the different age groups. This fact is followed out further by first dividing the children tested by the author into five grades according to the quality of their school work. From these groups are then chosen an equal number of boys and girls, 28 to 32, for each chronological age in such a way that the average grade for each age is always the same, the third or middle of the five grades. The average mental age for each group should then approximate the chronological age in each case. For this is only another way of saying that the number of retarded and advanced should be equal. The following are the results of this comparison:

Age	7	8	9	10	11	12
Av. Men. Age....	7.16	8.43	9.00	9.97	10.65	11.42

If a majority, let us say a bare majority of 51%, test out at age, and if the number of retarded and advanced are equal, it leaves 75.5% of the children of any chronological age that will pass the tests of the corresponding age group. The question as to whether the majority should test out at age and the question as to what percentage should pass the tests of any age group may therefore be considered together. They involve another question still. This is whether the distribution of the number of children belonging to each of several grades of intelligence, assuming that the whole range of intelligence has been divided off into several equal steps, gives the normal distribution curve or whether the curve is skewed in either direction. The interrelation of these questions becomes clear as the author proceeds with the analysis. Binet nowhere states definitely what percentage of children of any given age should pass a test for that age in order that the test may be regarded as of the proper degree of difficulty for that age. From scattered remarks it is evident that he places it between 60% and 90%. Goddard places it at 75%. Terman and Childs at

66%. Some empirical results to show what the proper percentage to be assumed is, are offered. In the first place the actual percentage of the number of children at each chronological age that pass the test for that age are as follows:

Age	7	8	9	10	11	12
Per cent. passing tests..	80.4	84.5	72.3	71.8	56.8	58.6

The author concludes that these figures indicate that 75 is about the correct percentage. But he approaches the question in a second, different way. The question may be regarded as analogous to the question as to what shall be regarded as "satisfactory" in the quality of school work. We may always assume that the work of a majority of children shall come under the classification of "satisfactory." Accordingly the author asked the teachers from four schools to classify 2,772 children into five grades, the middle grade of which was the "satisfactory" grade, with grades 1 and 2 less than satisfactory, and 4 and 5 more than satisfactory. The distribution over these grades gave the following:

Grades ..	1—2	3	4—5
Per cent.	25.7	50.8	23.5

This gives about 75% as doing satisfactory work or better. The classification of the children tested with the Binet-Simon tests into retarded, at age, and advanced gives almost identical figures for the three classes.

These data so far might indicate that the distribution for several grades of intelligence arranged in order, corresponds to the normal distribution curve, without skews or other irregularities, and with about 50% or more in the middle grade. This question has been theoretically considered by various authors. Some have assumed an approximate identity between the two curves. Others have emphatically denied it, while others still regard it as an open question. The author joins in the last opinion, and holds that no empirical proof is possible, but believes that the curves are probably identical.

Returning now to the question whether the majority of the children tested with the Binet-Simon tests should test out at age, we saw already that the empirical results closely approximate this demand when the results for all ages are taken together. But again, when each chronological age is considered separately this no longer holds, and cannot. This results from the fact that a mental retardation of a year does not represent the same degree of retardation at all ages. A year's retardation in a young child will increase to several years with age. Thus for the higher ages there will be relatively more with a year or more of retardation, and relatively less who can test out just at age. Thus it follows that for the younger children the group that tests out at age will be relatively large, for the older children it will be relatively small. If the results for all taken together gives a bare majority that test out at age, less than a majority can belong to this group in the case of the older, and a great majority will belong to it in case of

the younger children. The author gives his empirical results showing how this works out, leaving the symmetry of the distribution curve unaffected for the different ages, but giving a decreasing number belonging to the "at age" group with increase in age.

In conclusion the application of the tests with the feeble-minded is considered. Chotzen examined a number of children of the Hilfsschule with the Binet-Simon tests. One of his conclusions was that with these children the absolute magnitude of the defect, that is the number of years of mental retardation increased with age, so that a year's retardation for the higher ages meant less actual deficiency than a year's retardation for younger children.

This raises two questions. (1) How much mental retardation at each age must there be in order to characterize a child as feeble-minded? (2) What rule does the increase in number of years of retardation with age follow with the feeble-minded? In regard to the former, Binet put the limit at two years, and he evidently regarded this two years as representing the same degree of deficiency at all ages. The error in this is seen further from the fact that the two or more years of mental retardation occur much less frequently in public school children for the younger than for the older. We may divide the mental by the chronological age and obtain an "Intelligence quotient," (I. Q.) a term first used by Stern, which would represent the true degree of deficiency. Thus a retardation of one year at five, two years at ten, and three years at fifteen, or an I. Q. of, 4-5, 8-10, and 12-15, would always represent the same degree of defect, and might give the limits between the normal and feeble-mindedness. But it is questionable whether the intelligence quotient is constant through the whole course of mental development of the feeble-minded. "It assumes that the feeble-minded child develops at the same rate until his intellectual development comes to a standstill, only he develops slower than the normal." The author points out three objections to this assumption. (1) The younger the children are the more difficult it is to determine differences in their intellectual development. We could arrange twenty normal twelve-year-old children in the order of their intelligence, but one could hardly do the same with twenty three or four-year-old children. Likewise feeble-mindedness can hardly be recognized in very young children. (2) It seems more correct to assume that feeble-minded children develop at a retarded rate that decreases more and more with age than at a retarded rate that remains constant. (3) Chotzen's results in testing children of the Hilfsschule are in harmony with this last assumption. His results give intelligence quotients for the different ages as follows:

Age	8	9	10	11-12
I. Q. ....	.79	.72	.70	.67

It is likely that normal children also develop mentally at a constantly decreasing rate instead of at a constant rate. This would correspond with physical development, and the course of brain development especially sug-

gests it. It is further supported by facts from results with the tests. For eight tests the difference in performance for six and seven-year-old children was 31%. For seven other tests with eleven and twelve-year-old children this difference was only 16%. Thus the normal amount of progress in a year decreases with age.

This article shows throughout the same thoroughness and penetrating analysis that characterized the former article by this author. It throws much light on several very baffling questions. The chief ones of these are perhaps the question of the percentage of the number of children that should pass a test in order to make the performance in that test characteristic of the age for which it is used; and the question as to how many years of mental retardation at each age are required to constitute feeble-mindedness. The latter especially is a question over which there has been much confusion and error. Binet's view that a year of mental retardation represents the same degree of deficiency at all ages is still generally held by those not entirely familiar with recent developments in the facts and theory of the method. But it involves an unpermissible and unnecessary degree of error. Bobertag has made this clear and at the same time, perhaps, laid the foundation that may make it possible to solve this problem in a way that will enable us to tell exactly the degree of mental deficiency that is represented by any given number of years of mental retardation at each chronological age.

Faribault, Minnesota.

F. KUHLMANN.

Zur Kenntnis der gehauften nichtepileptischen Absencen im Kindesalter. M. FRIEDMANN, *Zeitschrift f. d. ges. Neur. u. Psych. Orig.* 9, S. 245, 1912. *Translated from an abstract by Gott (Munchen) in the Zeitschrift fur Kinderheilkunde, Vol. III. Sept., 1912.*

Friedmann calls attention anew to a form of attacks which occur in children similar to that which he reported five years ago. They are the so-called "Repeated Absences." These bear no relation to epilepsy and apparently have nothing to do with hysteria. They are characterized by the following peculiarities: They begin in apparently well children from the fourth to the seventh year, usually suddenly after some excitement (fear, operation). They consist in short, light disturbances of consciousness without convulsions and without falling. They come on at first in a great number of attacks (six to ten to one-hundred per day and occasionally at night). The course of the disease is very tedious, usually being seven to eight years. There may be also long remissions. They have no disturbing influences upon the mental or bodily development of the child. This is a chief argument against their relation to epilepsy from which they, moreover, differ in that the occurrence of convulsive attacks almost never take place (fast voellige ausbleiben). They are also to be distinguished from epilepsy by the history. Against their hysterical nature, the uniformity of the attacks, in spite of continuance

for years as well as the lack of other symptoms which would make one suspicious of hysteria, may be cited. The "repeated absences" presented a good prognosis in that they appear to clear up before puberty even without treatment. As far as the systematic placing is concerned, they may be related to the narcolepsy of Gelineau and the other somewhat half understood "neurotic absences" of adults. It seems that they appear upon the foundation of a spasmophilic diathesis as in the three cases which have been so far recently tested electrically the increase of electrical excitability and cathodal opening contraction with less than five milliamperes has been observed (two of these observations were made by Mann).

University of Minnesota.

JULIUS P. SEDGWICK.

NEWS AND NOTES

Mr. R. Ishii, of Sugamo, Tokyo, Japan, who some years ago was a student at the Seabury Divinity School, Faribault, and a frequent visitor at the Minnesota School for Feeble-Minded and Colony for Epileptics, has written to the Editor an interesting letter describing his work for feeble-minded in that country. Mr. Ishii is of royal descent, a convert to Christianity, a man of high ideals who is devoting his time and means to the service of the unfortunate among his people.

He began his career as a philanthropist after a terrible volcanic disaster in which hundreds of children were made orphans, by expending his private fortune in their care. He soon discovered that a certain percentage of his proteges were feeble-minded who required special treatment and training, and on coming to this country to prosecute his studies in divinity, he also investigated our methods of institutional care of the mentally defective. On his return home, Mr. Ishii introduced many of these methods into his own institution, especially in industrial training so that the normal and the defective children are now helping materially to make the home self-supporting. Some of the orphanage girls are either teachers or nurses of the feeble-minded, in that way earning their own support.

The first site of the home being too small for expansion and also in somewhat dangerous proximity to an arsenal and powder factory, a larger site was purchased beyond the danger zone. On this, new buildings have been erected so that the institution now comprises two dormitories, chapel, school-house, office, and hospital, a very creditable showing in face of the fact that Mr. Ishii also has had to contend with the universal drawback of short funds.

Photos of the institution show a very attractive environment. Mr. Ishii is a reader of the *Journal of Psycho-Asthenics* and so keeps in touch with what is doing in this country.

Brazil is considering the erection of its first institution for feeble-minded. With this in view the Brazilian government is sending two men, one a physician and one a pedagogue, Dr. Gustavo Mangus and Cordeirode Fovias, to study the questions involved on the continent of Europe. So we learn from the *Nyt Tidsskrift*.

With January, 1913, comes a new institution periodical, "The Colonist," from Sonyea, N. Y. It is a monthly published by the Craig Colony. It is full of colony news, flavored with good selections and exhales a wholesome spirit.

A very sensible statement by Goddard concerning sterilization and segregation has been reprinted from "The Child," by the Sage Foundation.

The state of Washington has appropriated \$230,000 for new buildings—thus doubling the accommodations at Medical Lake.



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No. 4

THE IMPROVABILITY OF FEEBLE-MINDED CHILDREN

BY H. H. GODDARD, Ph. D., *Vineland, N. J.*

How improvable is a feeble-minded child? This question is so fundamental, and so much depends upon the answer to it, that it is no wonder it has been the burning question since the care of the feeble-minded became common. Historically it has played no small part in the progress of the institutional care of these defectives. For years and years it was believed that nothing could be done for them and consequently nothing was done. Then, under the inspiration of the immortal Seguin it was discovered much could be done, and it is no wonder that in the enthusiasm of that discovery many went to the opposite extreme and believed that they could even be cured.

It is somewhat unfortunate that to-day there are certain belated travelers along the road who will talk of curing feeble-mindedness, while the impossibility of the cure of this condition has long been demonstrated. The question of improvability has had its ups and downs from the time of Seguin until the present. To-day we might be said to be in the blackness of confusion. We think feeble-mindedness is improvable, from one standpoint; considering it in another way, we conclude it is not.

We know that there is a time when the feeble-minded have reached their limit, and our institutions are largely filled with individuals who are known to have long since passed their limit of

improvement. In the case of younger children we still talk about improvable and unimprovable cases. In the case of any particular individual there is or has been in the past, very little dispute among those who know the case. More recently we have been led to question this, and we at Vineland, have had some dispute as to whether a group of children was improving or not improving.

Viewed from the standpoint of our usual definition of arrested development, the question is, are these persons already arrested in their development, or are they only in the process of arrest? And if the latter, how long does this process continue, and what is its method? Does a child develop at a normal rate up to a certain point and then suddenly stop, or does he develop slowly from birth up to a certain age, and then stop? Or again, does he develop at a normal rate for a few years, and then take a few years in which he keeps getting more and more backward, continually slowing down and finally stopping?

Whatever theories there may have been in answer to these questions, there have never been so far as the writer knows, any facts to substantiate the position until the present time. The reason for this lack of data is, that we never had any adequate means of measuring the mental development of a child at any one time. That difficulty has now been remedied through the Binet-Simon Measuring Scale of Intelligence, and on the basis of this we are now able to present data which seem to go a long way toward answering the question. This scale of intelligence has been in use at Vineland for two years, thereby giving us three annual testings. Upon a study of these results we ought to be able to answer the question, "How many children are improving and how many are standing still?" We had hoped to be able to do this after one year, but we found that there was considerable variability, which experience taught us was entirely normal with the feeble-minded children, they doing one day what they cannot do the next, or vice versa; so that we are compelled to wait for the end of the second year giving us the third testing before we could draw any definite conclusion.

The facts here presented are based upon the examination of

three hundred forty-six children of both sexes, of mental ages from one to twelve, and physical ages from five to forty, with a few beyond this upper limit.

We have had three annual testings by the Binet scale, the result is that from the first to the last testing, two years apart, one hundred and nine persons have made no variation whatever, not even a point. This is thirty-two per cent. If we add to this those who have gained or lost one or two points, we have two hundred thirty-two individuals, or about sixty-seven per cent. whose variation is so slight that it must be considered accidental. The remaining 33 per cent. have gained or lost three points or more. If we subtract those who have lost, we have left ninety-six persons or twenty-eight per cent. who at first sight seem to have made some definite progress. Closer examination, however, convinces us that some part of this is due to what we have sometimes called the normal variation of the abnormal mind; in other words, that it is somewhat an accident, perhaps of attention, as to whether a child answers one question more or one question less than he did on a former occasion.

A fact which makes us believe that much of this is due to accidental variation, is that these changes occur quite as often in the older persons, who, no one of experience, believes is actually increasing in mentality, as they do among those of the younger years where we might more naturally expect it.

These data wait further analysis and study, and the application of further studies, but it seems to be pretty clearly indicated that the vast majority of feeble-minded children are not changing and are not improving in their intellectual level; if there is an improvement it seems to be during the mental ages of three to nine inclusive. Among the idiots, for example, it is very low indeed; here are the figures for the idiots, that is, those having a mentality of one or two.

1. Of twenty-one idiots testing one year mentally, only one is able to do any of the Binet. He (a boy of fifteen) has from the first testing, known his eyes and mouth but has made no improvement. All have stood still. That is, twenty-one idiots, mentality one, age eight to thirty-eight, have made no progress.

2. Of thirty idiots testing two years mentally, twenty-seven, ages ten to thirty-six, have not changed; three, aged respectively eleven, twelve and seventeen have learned one point in the Binet.

Of twenty-five idiots testing 2 1-5 to 2 4-5, fifteen have not varied except when the test was given by inexperienced persons and a retesting brought back the former grading. These fifteen range in age from seventeen to thirty-six. One, aged thirty, has lost one point, 2 2-5 to 2 1-5, and five aged fourteen to twenty-one, have gained one to three points, none reaching higher than 2 4-5 by this gain.

The remaining four started two years ago with a "potentiality" for three years mentality and have advanced as follows:

F. 14—2 2-5 to 3 2-5.

F. 15—2 3-5 to 3.

F. 16—2 3-5 to 3.

M. 12—2 4-5 to 3 1-5.

The conclusion that we are thus forced to accept, namely, that a very small percentage of feeble-minded children is making any mental improvement, is both surprising and somewhat discouraging, and will even be rejected by some as certainly fallacious; for do we not know that they are improving? Do we not see them improving every day? Are they not learning to do things?

The great group of the so called improvable children are doing things to-day that they could not have done a year ago. This is most certainly true, and in this fact lies our excuse for our institutions with their training departments. Nevertheless it is not difficult to show that this is not incompatible with the conclusion drawn from our data. To make this clear it is only necessary to call attention to the difference between what we may call trainability and raising the intellectual level.

A normal boy of eight, for example, has what we may call for convenience, eight-year-old intelligence; his intelligence is not yet as high as that of the normal boy of nine, still less of ten, but he can do certain things, namely those things which involve nothing more than eight-year-old intelligence. He cannot do anything

that involves nine-year-old intelligence or anything higher. Now the normal boy is of eight-year intelligence only one year, and then he becomes nine years old and does the things that involve nine-year intelligence. Then he becomes ten years, and so on, until he reaches his complete development. But the feeble-minded boy who is arrested in his development at the age of eight remains with a mentality of eight year after year. As the years go by he can never learn to do things that require nine or ten-year-old intelligence because he never has that much intelligence, but there is no limit to the number of eight-year-old things that he can learn to do. It is this trainability to do anything and everything that involves only eight-year-old intelligence that is generally mistaken for increase in intelligence itself; and this is the explanation of the misunderstanding when the psychologist says the child has not improved and the teacher says he has; the former means that he has not increased his mental level, the latter means that he has learned to do a number of things that he could not do a year ago. Both are correct. He has learned to do these things and he will continue to learn to do new things for a good many years. but he can never learn to do anything that requires a higher intelligence than that at which he was arrested in his development.

So far we have not answered the question, "How does the child reach his point of arrested development?" Is it by a gradual slowing down or by a sudden stop? Nor can we answer this question surely, as yet. Perhaps it is a matter of the individual. Some develop one way and some another. The full answer to this part of the question must wait further study

There are some indications, however, that some children are pretty nearly normal until about eight or nine or ten years of age, and then they stop rather suddenly. For example, children test normal at six, and defective at ten, never having developed beyond seven. Or defective at twelve, not having developed beyond nine. Others seem to have always been a little backward, but kept getting more and more backward until the age perhaps of nine or ten, when they seem to have entirely stopped. It must be possible to measure the rate of progress sometime when our psychological methods become more complete, and to even

measure the rate at which the slowing down progress is going on and so predict very closely the age at which there will be a complete arrest. This, when we attain to it, will give us an immense advantage in the diagnosis and in the training of these children.

From the conclusions that we have so far drawn, it is evident that our educational treatment must be largely modified. When once we have discovered that a child is stopped in his development it is, of course, useless to attempt to teach him to do anything which requires an intelligence above that which he possesses. The notion that by setting him a task somewhat ahead of his ability will somehow draw him up to that capacity, is forever exploded. It is pretty certain that intelligence develops, as we may say, of itself, and yet we only utilize and exercise what is there, and do not create anything new by any of our training methods. Here we may conclude that as a rule, feeble-minded children are trainable but not improvable in intellectual capacity.

DISCUSSION

Vice President Carroll: Dr. Goddard's address is now before you for discussion.

Dr. Rogers: Mr. Chairman, I am exceedingly glad that Dr. Goddard has given this explanation because this is one of the things that seems to be misunderstood in regard to value of laboratory tests. The process of mental evolution between birth and puberty might be likened to the movement of the bundle carrier of a dry goods store that starts upon its trip across the room under the impulse acquired from the salesman who gives the handle a vigorous pull. The momentum thus acquired is not increased by any other force acting upon it, though its progress may be delayed or stopped by any object placed in its way. If the impulse given to it in starting is insufficient to carry it to the cashier's desk, it is obvious that it will move with less than normal speed at first, gradually slow down and finally stop on the wire at the point where the energy becomes exhausted, or it may stop suddenly because of some unsurmountable obstacle. Here the simile ends.

The capacity for learning at the different ages during the evolutionary period might be likened to tin cups of uniform diameter but varying in height. The short cup can not be made to hold more than its capacity, so no amount of training will enable the child of a low mental age—the short cup—to perform the things which only a person of higher mental age—the long cup—can learn. On the other hand there are things that a child of any given mental age can learn to do,—the number increasing with the advance of mental age to the end of the period of mental evolution.

Dr. Fernald: Mr. Chairman, I have been trying to reconcile Professor Goddard's statement with our definite method of instruction. What Dr. Goddard has just told us is the most significant, in a way, and the most discouraging statement that we have ever known. I am afraid it is true. No one believes in the possibility of education for the feeble-minded more than I do, I am sure, but I have always had the feeling that we were bound by some very definite limitations in each given case, and that the most we could do was to develop to the uttermost the potentialities of that particular case. I suppose that that applies to all of us. We are all bound down by protoplasmic limitations, that is to say, we have a certain voltage and a certain amperage, to use electrical terms. The quality and quantity of our mental possibilities are probably pretty well defined at our birth.

I am puzzled to know—I wish Dr. Goddard would straighten me out on it—the explanation of the following case: We have a feeble-minded girl nine years old, for instance, who was admitted to the school and put under training when she was six. She couldn't have the nine-year-old capacity, of course, at the age of six. I wish Doctor Goddard would give us a diagram of what happens to that six-year-old girl who finally gets to the ninth year of age. What was her mental age probably when she was admitted at six? In examining a six-year-old case or a seven-year-old case, what is to be our yard stick for prognosis for encouraging or discouraging ourselves as to the possibilities in that particular case?

Dr. Goddard: Mr. Chairman, of course, the child who is

now nine, who was admitted at six, must have progressed. There is no question about that. The answer is involved in what has already been said by Dr. Rogers. Our findings would indicate that the children that come to this particular study at Vineland have stopped or nearly so by the time we get them. Now whether their stopping came suddenly or after a slow-moving course, our experience does not show, but a case like that which Dr. Fernald proposes would lead us, I should say, clearly to the conclusion that there must have been a slowing down or slow movement from birth, if you like. The mental age of the child could only be decided after the stopping point came. There is one point further which was suggested to me. I thought it was what Dr. Fernald had in mind when he first spoke, viz: the relation of this to our training. Take the case of a child, say nine years old, mentally, if you like, to which we give on the start a very elementary piece of mechanical work, and then gradually lead him on. I don't know whether that is what Dr. Fernald had in mind, but I think we can illustrate the point by ourselves when we learn a new occupation or achievement of any kind. I should doubt very much whether psychological tests would show that any of us are increasing now in intelligence. I should think that probably our minds have reached the maximum. On the other hand, we are increasing in knowledge and wisdom and all that sort of thing. For example, we decide to learn typewriting, and after a time do succeed in learning it. We would not conclude that we were any more intelligent than we were before, would we? I admit that I don't know, but that is the way it seems to me. Now then, if that is the case and we are in a sense, in the condition of this child with its arrested development—the point I want to make is that in learning, the steps must be progressive so that, for instance, in typewriting, the first thing we would do would be to learn a very elementary phase of the subject and when that is mastered, go on with the next step and the next until finally we get where we can write a hundred or two hundred words a minute, whatever the appropriate speed is, without looking at the keys at all. In the same way we take our children in the institution and knowing what their mental capacity is,

their mental age, if it is nine, we say, "This child now is capable of doing any of the nine-year-old things," but we can not expect him to do them in the first year we set him at it, or whatever the proper period is. We must begin with him on the simple elements of the task down at the lower age. We may have to actually start him pounding at random and train him until he has acquired that particular thing. The first training may be pretty largely a matter of neuromuscular control, so that while in a way, as Dr. Fernald says, it is discouraging to us, in another way I don't think it is. I don't think it takes away the necessity or desirability of the very careful training we are now giving along these lines, but it does suggest, it seems to me, that we must do our training much more rationally. I will never undertake to start a child who is nine years old mentally, on a job that requires eleven-year-old intelligence. I don't know whether I have made that clear or not. I think I have it clear in my own mind.

Dr. Downing: I would like to know how you explain a case like this: The child I have in mind was physiologically eight when he first came to me though only five years old mentally, a well developed child physically. He has gone on in school until he reads well and he enjoys especially anything of a dramatic nature in reading. The dramatic instinct in the child is very strong and growing. He showed no sign of being interested or being able to do anything in numbers until last fall. He didn't know what one cent represented. He couldn't add it to another one. Within the past three months, through some training in number work, he is becoming a rapid calculator in addition. He is growing on that side, yet his intelligence on the side of reading is ahead, far ahead of a child of his physiological and mental age. He has a strong liking for physics and shows intelligent understanding of its simple elements. Now that is a very one-sided development. What about that?

Dr. Goddard: May I ask a question? Is this a feeble-minded child?

Dr. Downing: It is a decidedly feeble-minded child, a child that ten years ago I would have placed in the school at Vineland.

Dr. Goddard: I can't explain the cases of exceptional de-

velopment. I have found quite a few of them in ungraded classes, children who can read excellently and who can't do anything in numbers, or vice versa. I don't know whether it is at all interesting to you to know what comes into my mind sometimes in connection with such cases, that possibly there is some analogy between them and the normal subject that is under some hypnotic influence. We know that under the condition of hypnosis there is what we call, for lack of a better term, a concentration of attention, which enables a person to do things and recall things which he does not do in his wide awake consciousness. I have sometimes thought that perhaps in some of those cases there was an actual oblivion to all the disturbing factors, and whatever mind the person had, had simply become concentrated on this one thing, and perhaps this might account for the success achieved. This is not offered as a definite explanation but the thought has often suggested itself to me in this connection.

Miss Boehne: Mr. Chairman—One teacher of my special classes who is very excellent in speech training, came down to my office one day and asked for a set of fourth grade readers for the older boys in her class. I immediately wanted to know what she wanted with those readers. She said they had completed the third grade books and were ready for more material, and I said, "Well, if that is the case, we perhaps had better have those children examined again." I sent my examiner out there, and much to my surprise I found that every one of these children graded one, two or three points beyond the previous examination. They were boys from fourteen to sixteen years of age and registered eight and nine, mentally. There was one child that was very uniform in his work and could do good "third A" work and seemed to be almost ready for fourth grade work, so I recommended that that child be transferred to fourth grade B and see what he could do with the fourth grade work. The other children I recommended to remain in the class and to lessen the emphasis that had been placed on the reading and mental work, etc., but emphasize the industrial work more, and I thought I would make a comparative study between these children and this child who had been recommended to the fourth grade. With-

in a few months the principal reported absolute failure with the boy who had been transferred and he had gone back almost to the regulation stage of the eight or nine-year-old child, and the boys who were in the industrial department had stayed practically where they were previously, and had been able to read and write as they had in the third grade work.

DEGREE OF MENTAL DEFICIENCY IN CHILDREN AS
EXPRESSED BY THE RELATION OF
AGE TO MENTAL AGE*

BY F. KUHLMANN, *Faribault, Minnesota.*

The object of this brief discussion is to present a scale of mental ages intended to roughly indicate the grade of mental deficiency of defective children on the basis of their combined chronological and mental ages. Incidentally this will indicate also the probable mental age in the future of any given child. The classification of mental defectives according to their mental ages had led to a confusion that needs to be cleared up. The mental age alone correctly indicates the degree of deficiency only in the case of adults, or after a chronological age is reached where intelligence has ceased developing. In the case of children the degree of deficiency must be expressed by some mathematical relation of the mental and chronological ages. This fact is usually overlooked by those not entirely familiar with the subject. The mental age classification of defectives has certain significant advantages over the old method of classifying into idiots, imbeciles, morons, and sub-classes, besides the greater accuracy that the method gives. Let us first compare the two in this respect. This will make clear the nature of the error involved in letting the mental age alone or the difference between the mental and chronological ages, represent the degree of deficiency in the case of children.

The old method of classifying aims to divide the range of

*This article was in manuscript when a recent publication by Bobertag, which contains the main ideas on which my scale of mental age is based, came to my notice. (See "Ueber Intelligenzpruefungen—nach der Methode von Binet und Simon"—*Zeitschr. f. angew. Psychol.*, 1912). The essential points that he makes are (1) that the normal rate of development is a constantly decreasing rate, so that a year of normal mental development becomes less and less with increasing age; (2) that feeble-mindedness is a retarded rate of mental development. From this follow several corollaries which are discussed in this paper, some of which Bobertag also takes up and at greater length. Anyone further interested in these questions should not fail to read Bobertag's article.

mental deficiency, from the lowest to the highest grade, into more or less equal steps. The division is admittedly arbitrary. There are no fixed points of reference for the different grades, but only for the two ends of the scale. The lowest grade idiot represents the mental development of the normal child at birth. The highest grade represents the case just a little too deficient to be called normal. For the points between these two extremes needed to fix the limits of all the grades there are no fixed facts of reference. We must arbitrarily assume certain symptoms for each grade established. Of the two fixed points at the two extremes of the scale the first is again much more definite than the second. The development of the normal child at birth may be regarded as constant. It is also something with which we are more or less familiar. But the line drawn between the normal and the defective is by no means constant. It shifts according to the examiner because of varying ability and methods of examining. It shifts also with changing standards of the normal in the progress of time and under different social and other circumstances of the person examined. But to arbitrarily assume a set of symptoms that shall represent each grade of the arbitrary scale from the low grade idiot to the high grade moron, and to all agree on these, might not be an impossibility. We have, however, never reached this point with the old scale. The symptoms of the idiot, imbecile, and moron have never been described in sufficient detail to enable an examiner to accurately grade defectives by this scale. To divide each grade further into subclasses is still very largely a matter of the individual examiner with whose results the results of another examiner would agree only in a very rough way. But assuming that we had come to an agreement as to the symptoms that should be chosen to represent each grade, this would not guarantee the equality of the steps into which the scale is divided. For to divide off the range of mental development into any such steps implies some sort of unit of measurement of mental development. But we have no such unit of measurement, or anything that could be taken to represent it. This will be made clearer directly.

This arbitrary scale has grown up chiefly in connection with

the grading of adult defectives. A further difficulty is met when the attempt is made to apply it to defective children. Feeble-minded children make some progress in mental development, but the rate of progress is slower than the normal. Hence what we might regard as evidence or symptoms of a certain grade of mental development, the imbecile grade, for example, in a given child may change with age to symptoms of a higher grade. The class into which a child would fall would therefore be determined by his age as well as by his real degree of deficiency, and at birth, to be strictly logical, all children would have to be called idiots. But this is evidently not what we mean by a grade of deficiency. We mean by it the amount below normal, or, from another standpoint, when we speak of children we may perhaps call it the capacity for development. Hence in grading feeble-minded children by the arbitrary scale we must somehow take account of the chronological age, either by making some sort of "allowance" for it, or by finding symptoms of capacity for development in place of symptoms of grade of development in adults. Considering the point we have reached in this matter in grading adults, it needs no discussion to understand that we have not even begun to make this adjustment of the arbitrary scale for the grading of feeble-minded children.

The classification of the feeble-minded according to their mental ages involves nothing that is arbitrary. There is a fixed point of reference for every grade instead of for only the beginning and the end of the scale. Each mental age represents the abilities of the normal child of the corresponding chronological age. When it comes to the finer distinctions we may have only an incomplete knowledge of the difference in the symptoms or abilities and acquisitions of one mental age and the next higher or lower. But the normal child is always there to refer to and consult. His mental characteristics for a given chronological age are always the same. We do not, therefore, as in the old classification, need to pick out a certain group of symptoms and arbitrarily assume it to belong to a certain grade of mental development. For the rougher distinctions no special knowledge is required. Everybody has some idea as to what a normal child

at a given chronological age can do. Attributing a certain mental age to a feeble-minded child or adult, therefore, means something, whereas classifying him as a middle grade imbecile, for example, means very little to anyone not entirely familiar with the feeble-minded and this classification.

These are the chief advantages of the mental age classification over classifying by the old, arbitrary scale. But when it comes to classifying feeble-minded children instead of adults one of the old difficulties remains. The mental age in case of both the adult and the child indicates present abilities. With the former it indicates grade of intelligence or degree below normal as well, since intelligence has become fixed and is no longer developing. With the child it does not alone indicate the degree below normal, as was noted above. It does not alone show the capacity for development in the future. Children of the same mental age but of different chronological ages are not of the same grade. The younger are the brighter. They are not so far behind the normal. This much is in fact readily understood. But the error constantly made is in the supposition that we need only to subtract the mental from the chronological age in any case to get the true degree of deficiency in the difference. It is assumed that a given number of years of mental retardation always represents the same degree of mental deficiency, independently of what the chronological age is. A year behind at twelve, for example, is taken to mean the same as a year behind at six. This is by no means the case. The older here is the brighter, is less behind the normal in grade of intelligence. We may indeed again, make some sort of allowance for the chronological age in any given case and thus roughly estimate the true degree of deficiency from the mental age that has been found. But this sort of allowance and estimating involves the same process and source of error that we have in grading feeble-minded children by the arbitrary scale, although it may be much reduced because of the fact that the mental age represents present abilities more accurately than does the classification into middle grade imbecile, or low grade idiot, for example. How can this difficulty be avoided? Can we find some relation or relations of mental and

chronological ages that will give the true degree of deficiency in the case of children as well as with adults? The scale of mental ages given below is intended to give a provisional, approximate solution. But before presenting this it will be well to consider further why the mental age alone, or the difference between the mental and chronological ages, does not represent the degree of deficiency in the case of children.

There are two reasons. One is that the rate of normal mental development decreases with age. Mental progress is rapid for the first few years and becomes slower as maturity is approached. We have at present no means of really measuring this rate of progress and its changes. But there is evidence of a change. The rate of development of the brain, as measured in terms of weight, decreases very rapidly at first, and comes very gradually to a stop. Functional development, that is mental, is probably not entirely parallel to this, since there are several ways in which the brain can develop physically that might be very important for mental development, and yet add but little to the weight of the brain as a whole. But a rough relationship is always assumed.

- More important evidence is the direct evidence we have in observing mental progress at different ages. We can readily recognize the difference in mental development between a normal two-year-old and a normal three-year-old child, for example. Between the ages of six and seven this difference is already difficult to discover, and between the ages of eleven and twelve the recognition of progress by ordinary observation is quite impossible. Hence, we know without any method of accurately measuring progress that the rate of progress decreases with age, although there is a further matter that must be taken into consideration in drawing this conclusion. This will be noted in a moment. The amount of mental development during a year cannot in any way be taken as accurately representing a unit of mental growth. For this reason alone a child of three years who is mentally only two might be seriously deficient. But a child of twelve who is mentally eleven might be still quite a normal child. A year's progress at eleven is so much less than it is at two.

The second and more obvious reason why this mental age alone or the difference between the mental and chronological ages, does not represent the degree of deficiency of feeble-minded children is that the younger the child is the less time he has had to fall behind the normal in development. Feeble-mindedness is a retarded rate of mental development. The term "arrested development," or "mental arrest," is a misnomer, for it implies that development has ceased. It is a common observation that feeble-minded children do develop mentally. We also find that their mental ages as measured by the Binet-Simon tests increase as they grow older. But the rate of their development is below the normal. Thus, independently of the first reason given, a child with a given constant degree of mental deficiency may have been only one year behind at six and be several years behind at twelve. He falls behind a certain fraction of a year's mental growth every year. His degree of mental deficiency has not changed all this time, but the number of years of mental retardation has increased. A little computation will show that this second factor is probably much the more important of the two, because it is large even for the only slightly defective and increases with the degree of deficiency. If the rate of mental development is much retarded the number of years of mental retardation will of course increase rapidly. A rate of development not retarded enough to be determinable by present methods during early childhood might show two or three years of mental retardation at the age of fifteen. A year's mental retardation during the first few years after birth would increase to several years by the age of fifteen.

This brings us to consider the further matter in connection with the greater ease with which we can recognize mental progress from one year to the next the younger the child is chronologically. It was noted that the fact that we can do this is evidence that the rate of progress decreases with age. We can see now that it may not be this decrease in rate of progress alone that enables us to do this, but that it is helped also by rates of progress that are retarded below the average normal rate and this increase in the total amount that the child falls behind with the increase in age. Young normal children are quite alike mentally be-

cause there has not yet been time for differences due to slight variations from the average normal rate of mental progress to accumulate. The degree of mental development at three stands out clear and distinct from that of two and four because the variations above and below the average are small. At twelve these differences have accumulated; the variations from the average normal are large, causing undoubtedly some over-lapping of mental and chronological ages within the range we call normal. That is, some normal children of thirteen would have a mental development equal to no more than that of the average normal twelve-year-old, and some eleven-year-old children would have a mental development equal to that of the average twelve-year-old. How much over-lapping of this sort there is at this age cannot be said definitely at present. But there is undoubtedly more than a year. We recognize that a child of thirteen with a mental age of twelve should not be called feeble-minded. The result of this is that the normal degree of mental development at the higher ages does not stand out clear and distinct from that of the next higher or lower as it does in the case of younger children. This tends to diminish the importance of the first reason given why the mental age alone or the difference between the mental and chronological ages does not represent the degree of deficiency in the case of children, and leaves us more with the second factor alone, the accumulation of the amount of difference between the mental and chronological ages with increase in age, as due simply to a retarded rate of development. We are now prepared to discuss a scale of mental ages that will show roughly the degree of deficiency for every relation of mental and chronological age.

Such a scale is easily constructed if certain assumptions are granted, and if we leave out of account the matter of the decreasing rate of mental development as age increases in the case of normal children. The latter must be left out of account because, although we may recognize this as a fact, we have no way of measuring the rate of progress, as already noted. In assuming the contrary we introduce an error. But the procedure is more justifiable than it would be to make some other assumption, that mental development runs parallel to brain development, for

example, the accuracy of which is equally unknown. Moreover this scale seems to work out better on the whole on this basis than on that of several other assumptions that were tested out theoretically. The other assumption required is that feeble-mindedness is simply a retarded rate of development whose ratio to the normal rate remains constant. If a child develops half as fast as the normal at any time he will continue to develop at that rate in relation to the normal. Now it is this rate of development alone that represents the true degree of deficiency, and if it bears a constant ratio to the normal rate the degree of deficiency is always shown directly by the fraction given by the mental age over the chronological age. If the rate of mental development is not constant for normal children we cannot find the degree of deficiency in feeble-minded children in this simple way. This will be clear from the following illustration. Let us suppose that we could measure mental development in terms similar to the centimeter in spatial measurements, and assume that the normal child develops 50 units a year. We would then have the following for the first four years:

Years	1	2	3	4
Units per year.....	50	50	50	50
Total units	50	100	150	200
Total units at half rate....	25	50	75	100

If a child were mentally two years at the age of four he would have developed 100 units, or 100-200 of the normal, or at 2-4 the normal rate, which is given by the mental age over the chronological. Likewise we could compute what the mental age had been or would be for every age when the mental age for any chronological age is given. But suppose that the normal rate of mental progress is not constant from year to year, and that it decreases with age in something like the following manner:

Years	1	2	3	4
Units per year.....	100	50	30	20
Total units	100	150	180	200
Total units at half rate....	50	75	90	100

In this case a child who is mentally two at the age of four would have developed 150 units, or 150-200 of the normal, or at

3-4 the normal rate, a rate not given by the mental age over the chronological. This illustration also shows the direction of the error that is made by assuming that the rate of normal mental development is constant from year to year. It gives the mental ages too low for any given retarded rate of mental development, and this amount of error decreases with increase in chronological age. This may be seen by working out the above illustration further. Proceeding now with the assumption that the rate of development is constant, we may compute the course of mental ages for each rate of development or degree of deficiency from birth to the age of fifteen. This gives the following scale of mental ages:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
.1	.1	.2	.3	.3	.4	.5	.5	.6	.7	.7	.8	.9	.9	1
.1	.3	.4	.5	.7	.8	.9	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2
.2	.4	.6	.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3
.3	.5	.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4
.3	.7	1	1.3	1.7	2	2.3	2.7	3	3.3	3.7	4	4.3	4.7	5
.4	.8	1.2	1.6	2	2.4	2.8	3.2	3.6	4	4.4	4.8	5.2	5.6	6
.5	.9	1.4	1.9	2.3	2.8	3.3	3.7	4.2	4.7	5.1	5.6	6.1	6.5	7
.5	1.1	1.6	2.1	2.7	3.2	3.7	4.3	4.8	5.3	5.9	6.4	6.9	7.5	8
.6	1.2	1.8	2.4	3	3.6	4.2	4.8	5.4	6	6.6	7.2	7.8	8.4	9
.7	1.3	2	2.7	3.3	4	4.7	5.2	6	6.7	7.3	8	8.7	9.3	10
.7	1.5	2.2	2.9	3.7	4.4	5.1	5.9	6.6	7.3	8.1	8.8	9.5	10.3	11
.8	1.6	2.4	3.2	4	4.8	5.6	6.4	7.2	8	8.8	9.6	10.4	11.2	12
.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9	9.9	10.8	11.7	12.6	13
.9	1.9	2.8	3.7	4.7	5.6	6.5	7.5	8.4	9.3	10.3	11.2	12.1	13.1	14
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

In this table the first horizontal column gives the chronological ages from 1 to 15. The last vertical column on the right gives the mental ages at 15. The other figures give the mental ages at the different chronological ages for the different rates of development. Thus, if a child's mental age is 5 at 15 his rate of development is $\frac{5}{15}$ of the normal, so he will be .3 year at 1, .7 year at 2, 1 year at 3, etc.

The practical usefulness of this scale depends not on whether it is entirely correct, but on whether it represents the facts more closely than we can determine readily in any other way. Complete accuracy could surely not be claimed for it. But in assuming it

to be accurate we would be making less error than by assuming that a given number of years of difference between the mental and chronological ages always means the same degree of mental deficiency, as seems to be the custom now. We have some means of estimating its general accuracy other than the more or less theoretical discussion so far given. The best way to test it would be of course, to find out empirically the course of mental ages for defective children. But since this would require the annual testing of a group of defective children for every grade of deficiency from birth to maturity, such an empirical proof is quite out of the question. Some approximation to this ideal would be to find out the mental ages of a large group of defective children for each chronological age, the children for each chronological age being a different group. The average mental ages, if from sufficient numbers, should show the average course of mental progress from year to year. But this again would require the examination of thousands of defective children. We may consider the results of a smaller number, 1006 cases, arranged in regard to this point. In the next table are given results on the mental ages of the inmates of the Minnesota School for Feeble-Minded. The children are first grouped into chronological age groups of 6-8, 9-11 years, etc., as seen in the first horizontal column. In the second horizontal column are given the corresponding average mental ages as found by the Binte-Simon tests. In the third are given the mental ages as theoretically determined by the method followed in the above scale of mental ages. The computed mental ages are found on the basis of a mental age of 5.5 years at the age of 15, or at a rate of development of 55-150 of the normal rate.

Age	6-8	9-11	12-14	15-17	18-20	21-30	30+
Ave. Men. age.....	2.8	4.1	4.9	5.5	5.8	5.0	5.5
Computed Men. age.	2.6	3.7	4.8	5.5			
Difference .....	.2	.4	.1	.0			

This comparison of the empirical results with the theoretical determinations shows a close agreement. The difference is always less than half a year. It will be noted also that according to these figures increase in mental age stops at about the age of

fifteen. This seems to agree with our supposition about the intellectual development of normal children. It is an assumption made for the scale of mental ages given above. If, however, the method of computing these mental ages were carried further it is seen, of course, that the computed mental ages would continue to increase indefinitely with age. This is a minor discrepancy, but should not be overlooked. The last computed mental age given, 5.5, is for the age of 15 alone, instead of an average of computed ages for 15-17. This approximate agreement between the computed mental ages for this one rate of mental development, namely, the average rate for all grades of feeble-minded in general, and the actual average mental ages as found empirically may be taken so far as a proof of the correctness of the theoretical basis of the scale, the assumptions made, unless unforeseen errors are introduced by using the average mental ages in this way in place of the actual mental ages of the same children examined annually from birth to maturity. The possible misuse of averages leads us in conclusion to emphasize a necessary caution. The course of mental ages indicated in this scale for each grade of mental deficiency, even if the scale were entirely correct, represents the average case, and does not indicate what variations there may be from this average in individual cases. In certain individual cases the assumption that the relation of the rate of mental development of defective children to the normal rate remains constant may not be true. There are several ways in which variations from this average condition might occur. The feeble-minded child might develop at a rate that becomes retarded more and more with age. He might do fairly well at first, and fail to keep up his rate of progress, and even stop developing entirely before the normal child does. This is indeed an opinion sometimes held. But it is an opinion that can easily be derived erroneously because of the very fact as pointed out, that if feeble-mindedness is a retarded rate of development the amount of difference between the feeble-minded child and the normal will accumulate with age and become recognizable where first it was not. This is naturally interpreted as meaning that the child is not progressing as rapidly as at first. Secondly, the

opposite of this kind of variation from the average case might occur. A child might progress at a retarded rate at first and then improve with the removal of some physical handicap or other cause. Some have maintained that such a case is not one of feeble-mindedness. But the difference in opinion on this point arises over a confusion of the mental condition itself and the cause of it. If the child develops at a retarded rate his mental condition is that of feeble-mindedness, irrespective of whether the cause is permanent or remedial, unless we wish to misuse the term "feeble-mindedness" so it will refer not only to the mental condition but to the permanency of the cause as well. Its literal meaning excludes all reference to causes, and a child might be feeble-minded at first and become normal later. We might conceive of other variations from the average condition. But we do not know much about their actuality at present. The caution to be kept in mind is that we cannot use such a scale as the above as a means of predicting with certainty what the future and final mental age of a child will be. It tells us only what we may expect. It gives us probability.

DISCUSSION

Dr. H. H. Goddard: I am very much interested in this paper of Dr. Kuhlmann's. I fully agree with him on one point and think we all must. I think the method of estimating, by getting the number of years backward a child is, is a very crude procedure. It doesn't really mean anything at all. I can not yet see how results will fit in but it seems to me that there is considerable evidence that there are a good many children that develop at a normal rate up to a certain age and then slow down; some slowing down gradually and others rather rapidly. This is possibly accounted for by accidental conditions. Dr. Healy's case of traumatic feeble-mindedness is a good illustration of this. We have quite a good many cases, not a large percentage as yet, where it is pretty clear that they have developed very nearly normally up to the age of seven, eight or nine, so that I am very skeptical as to the possibility of formulating a rule for determining the rate

of development. Many cases are uniform in slowness while others vary a great deal; some slow up much more rapidly than others as has already been stated.

In connection with the first table of figures that was shown the question is raised as to the propriety of including idiots. On the other hand, we must remember that to a very large extent we have a selected group here. Dr. Mogridge stated that we probably have not more than five per cent. of the morons. Would not the figures be changed very much if we did have? Morons are not usually discovered until twelve or fourteen years of age. The picture to me of the development of the feeble-minded is rather that these different types develop each in his own way very much as the physical side develops. Different families have different determiners of development. Just as it was determined before I was born that I should be five feet, ten inches tall, I developed that height and no farther. In the same way, probably, that determiner carries with it the determination of the rate of development and the time. This carries with it the fact that I should have been an average boy from birth. As a matter of fact I was very much under-size until I was fifteen or sixteen years of age. Then I shot up. Other cases are over-size. It may be a false analogy but it seems to me to illustrate the rate at which these cases develop.

MENTAL DEFECT AS FOUND BY THE FIELD- WORKER

BY MISS ELIZABETH KITE, *Vineland, N. J.*

The few remarks which I have to make are such as I can recall from a paper prepared to read at a convention of field-workers at Atlantic City last week. There seems to be an occasional criticism of the field-workers which Dr. Goddard has sent out that they think that everybody they see is feeble-minded. So many black circles and squares upon the charts may lead to this inference very often. As a matter of fact, the field-workers have a difficult problem in deciding between the high grade defectives and those of lower grade. Before going out from our institution, the field-worker is subjected to a training in the use of the Binet tests and in making accurate diagnosis which helps very much in the field work. If we did not have such a training, we would have no guide in going out among people who are not considered as normal-minded. Any one who has read the work of Binet in the original knows that in season and out of season he reiterates his injunction to those who go into the work of deciding mental states that they do not rely upon subjective means, complaining that that has been the method almost universally employed—simply the impression which the child makes upon the alienist or physician or teacher, and while he admits that the alienists and physicians who are in touch with the feeble-minded and the teachers who work with them do arrive at very accurate diagnosis, yet they are not able to give their reasons for the diagnosis, so that he insists that something definite be laid down for a working standard. He says that very little reflection convinced him that there is one thing in the human intelligence that is fundamental, which, if alone tested, would be all that would be necessary to enable one to decide this very important matter, and that thing, he calls the judgment. A person who has had

judgment may measure feeble-minded persons and may possibly diagnose them as normal and some who are considered normal people have bad judgment, but if a person has good judgment and the examiner is able to determine this point, there is no possibility of such person being wrongly classed for good judgment alone places him in the rank of normal people. Now it has been this that has been forced upon our attention, and in going out into the field to decide upon the mental states of parents and relatives of the children which we have in the institution, we have always kept in mind this principle.

Another principle must be followed. I shall never forget the injunction which the superintendent of this institution gave just before I went out into the field and I do not think a better thing could be said to any field-worker upon such an occasion "Always leave the people you go to see a little happier for your being there." Now, in carrying out this idea over and over again when it seemed I was on the brink of getting some important bit of information, I would be reluctantly convinced that it wasn't the time, and I have left it for a more propitious opportunity. The most important thing is to leave them in a happy frame of mind, so they will be glad to see me again, and so I have striven first of all to develop the good feeling of the people. Now of course it has been impossible in going from family to family to make regular use of the Binet test. I never did test out a whole family but once and that was when I had grown familiar with them and I realized it was taken as a compliment. All the children were examined except one who was in school. The mother took me across the field, and she very proudly knocked on the door of the school room and with great importance said, "My children's getting tested and I want my Julia to come out." Of course Julia came out. She was somewhere between eight and nine mentally and her chronological age was between thirteen and fourteen. By judicious questioning, you can get a great deal of information without using a notebook, or the Binet test. In fact I have always made it a point to keep the notebook inconspicuous. Sometimes I draw a piece of paper out and say, "You are saying so much that interests me that I may

forget it. Would you mind if I put that down?" and immediately put it away again. Our motive is not in any way to bring publicity or annoyance upon the people, but only to get definite information concerning conditions as they exist.

There has never been a time when I have not found people of old families in the community. It goes without saying that in the cities we haven't the advantage we have in the country. But with very little investigation you can find the part of the country from which the city people came, and then by going to that part of the country you will always find families who remember them very well, or possibly, their parents or grandparents,—but persons who at any rate will give you light on the source from which these particular individuals have sprung. As far as possible, unless I find a person of exceptional intelligence, sympathy and interest, I avoid letting her know just what I am after. I use all sorts of ways of getting at information because it is perfectly true that I am immensely interested in the farming, in the crops and soil, being something of a farmer myself, and in the country I never fail to ask questions that relate to the farm, and it is very easy. If you have a farmer interested in the amount of his stock or in the amount of berries and fruit he can raise upon given ground, it is very easy to lead him to talk about the settlement and to learn if he knows certain other families. In that way I have often led up to an interest which I have been able to emphasize by stating exactly what I was after, but only at the end of a long conversation as a rule, and when I was perfectly sure of my ground and realized the question would not make any trouble for this individual in the neighborhood. I would then delve into the subject fully. Then there is an immense amount of information to be gotten from county records and especially from family Bibles. Some of my most interesting histories have really been based on the records I have been able to get out of old family Bibles.

There are a great many difficulties. We, of course, are fallible and make a great many mistakes, but certainly as a rule our mistakes are not in naming as defectives those that in reality are so; but once more, the spirit of the institution of Professor

Johnstone and Dr. Goddard is the thing we remember to take with us, but especially to leave with those from whom we secure information.

Dr. Rogers: I would like to ask Miss Kite if she has ever been absolutely refused information.

Miss Kite: No, I can't remember any case where I have been absolutely refused because I have very seldom asked a question that could be refused. I have once or twice gotten into a critical situation. Once, I remember, I had gone in the afternoon to see a man and inquired first for his wife. Finding she was out, I went back in the evening. I had grown so used to being well received, and in this case being in a great hurry—it was a very bad part of the city—and finding the woman busy closing the shutters, I unfortunately asked at once if her husband was in, before I had gotten in touch with her and found what sort of a woman she was. I said, "It isn't really you I want to see. It is your husband." She had in the meantime come to the door and I was forcing my way in. She tried to keep me out. I kept going in and talking on very glibly. I said, "He has an aunt and uncle down here." By the time we got into the kitchen the storm broke. She said, "If you want to ask any questions, ask me for it is my husband you want to see and him you wont see." With that she shook her fist in my face and said, "I will have you arrested. I believe you are keeping company with him." (Laughter.)

DISCUSSION

Dr. Rogers: Does not the family as a rule like to talk about their relatives, and is it not very necessary to interview neighbors and other people not related?

Miss Kite: Yes, it certainly is true, and it has been of great service to get the wife talking about her husband's relatives. (Laughter.) I remember one old woman who said, "Well, you see the boy always was like his father."

Dr. Rogers: That is a common experience with people whom we interview at the institution when a new child is brought.

If he is brought by the father, all the troubles come from the mother's side, and if he is brought by the mother, all the troubles come from the father's side.

In the matter of determining mental intelligence, Miss Kite has already stated that the evaluation of judgment was especially important; I would like to ask her what concrete standard she uses for making this evaluation. Isn't it after all really a question largely as to whether they have been able to make a decent living and to maintain themselves on a social and economic equality, we might say, with the particular social group to which they belong? Assuming, of course, that such a group is not anti-social.

Miss Kite: I intended to speak of this before. The knowledge of the children here at Vineland is our standard. I am constantly holding up the individual whom I am judging for comparison with the children or child we have here from the same family, otherwise, it would be impossible in many cases to decide. For instance, I am reminded of the case of a particular child. She is constantly before me. I am bringing her brothers and sister up by her side. She makes a brighter appearance than they do. It is very seldom that I can come to the point where I can take a meal with the family but we can sit in a room with them and talk with them and that brings out their reactions. Knowing the child here thoroughly, one can note the resemblance and difference and can measure very well. The child I have in mind at this time I have studied a very long while. The mother I knew instantly was of lower grade than the girl. The girl was of lower intelligence than the girl we have here. Two or three of her sisters were about on par with her. Two little children test about normal but they have that about them which indicates they are not. They are now six and seven and test five and seven respectively, perhaps indicating that when they are eleven and twelve, they will be about with the rest of the family. That, of course, can only be told definitely when they are older. We have the test of them now at five and at seven years, and later, of course, it will be of great importance to test them again in order to realize the rate at which they have developed.

Dr. Rogers: These cases that appear to test as normal afford illustrations of the doubtful point discussed in connection with Goddard's paper concerning the possible slowing down of mental evolution.

What do you do in the matter of recording heredity of disease? Where the parents, grandparents or some collaterals have died of cancer, for instance? Of course to handle such features fully requires special training for that purpose, but how much can you do?

Miss Kite: We get whatever medical history we can from the family itself and from the physician, but of course, that has never been emphasized with us. At least I haven't in my work emphasized it. It has not been required of me so much as the social aspect of the cases. It is the question of citizenship that is constantly in my mind going around to these people, the question of whether their bad ways of living are due to lack of intelligence or whether to environmental causes, whether there is really the capability of citizenship there and of the training of children to make good citizens. That is really the final test in a democracy that ought to be put to every individual because if he is to have the right of citizenship he should have the ability.

Dr. Rogers: That is right. Reactions to social and economic environment must be considered first. Of course, there are many hereditary diseases and abnormalities that have no apparent relation to the causation of mental deficiency. Their study is to an extent a side issue but we all hope for the time when the field surveys of these things can be carried on to supplement laboratory work. It would seem worth while at least to record as many such conditions as are found, being careful to have authoritative evidence as far as possible to the diagnosis.

Miss Kite: That is exactly what we are trying to do now. We want an analytical view of every individual defective, including as many facts about him as we can obtain.

A Member: It has occurred to me, in connection with the reference made to the family Bible, that it would be a good idea child's life during infancy and early life. There are little gifts to encourage mothers to keep a simple but regular record of her

books, you know, for recording the birth of children, when they cut their first teeth and so on. Could this record not be elaborated so that it would include a memorandum of defects, because in the near future children are going to be studied along these lines. Perhaps as an association we might suggest suitable records, not too elaborate, or certainly they won't be kept. There might be six questions or ten or twenty questions as the case might be. It would be valuable for many reasons in after life.

Dr. Goddard: It may be interesting to know that J. Madison Taylor of Philadelphia is preparing a book just on that line. I am not sure he has anticipated the points you speak of but at least he is working on something of that nature.

Dr. Fernald: I would like to ask Miss Kite how she manages to ascertain the exact mental condition of ancestors or collaterals, as to whether they were mentally deficient or were cases of terminal dementia or cases of dementia with termination leaving them on a lower plane. I should think it would be very difficult after the lapse of a generation to even approximate the facts. When I see the difficulty we have of making a diagnosis of cases before us I should think the difficulty would be increased when they belonged to generations that have passed. Not many of the published histories by Davenport and Goddard go back into revolutionary times.

Miss Kite: Of course, there are really but very few cases where we have endeavored to study the mentality of a person who has been dead seventy-five years, but still there are a few such cases, and of course the study has involved, I might say—not years—but certainly over a year of most intense investigation and questioning literally hundreds of people and going into records and leaving absolutely no stone unturned I could find in the way. For instance, take the one case now quite well known, (the "Kallikak" case), the revolutionary soldier whose child was the great great grandfather of one of our cases here. He himself died in 1860, his mother died in 1842. Now the information about his mother—I grant it is involved and her mental condition must be in a measure assumed for there is little direct proof for putting her down as feeble-minded because I can get no one who remem-

bers her, though I found several people who remember that their mothers recognized something about her different from other women and they talked about her a great deal. Now that alone would not have so much value if it were not considered in connection with known members of the family—this particular family, where there are so many dead members marked as defective, who have made such a profound impression on the whole neighborhood where they lived. They lived back in the mountains on a ridge and lived there for several generations. The old man died in 1860, somewhere about eighty or ninety. His mother had lived there before him and died between the ages of eighty or ninety in a cabin a little further back in the woods. There are people living there now whose family had heard of those people though it was a long, long while before I found the people who could give me definite information. In fact when we started on the investigation we had no idea that the girl down here had any remarkable history. It was only little by little that it began to open up. Finally I found that her grandfather had twenty brothers and sisters, and that of those twenty brothers and sisters there were four or five living today in a certain city in this state. I knew the name, of course, and looked in the city directory and found a great many of that name, because, I found out afterwards, they belonged to the legitimate branch of the family. They were lawyers, doctors and so on, but I found the name also in one or two of the nearest towns and I went to look them up, to see if they could tell me something about their ancestors, and found I had struck the right line. When I had gotten the right persons it was the easiest thing in the world to have them tell me the names of their brothers and sisters. I don't remember the excuse I had but I found something which was satisfactory and they told me the names. When I came to look up the families after I got the addresses of one or two, I soon found other sources of information. For instance, I came to one woman who was living apart from her husband, not divorced but living apart from him, and the moment I heard that fact I thought that probably she was a normal woman and I could learn some important facts from her. She was only too thankful to find some one who

had a sympathetic nature to whom to pour out her grievance. She was a woman of intelligence but of no education whatever. She said repeatedly, "I wish you could find out what ails that family. I don't believe there is another one in New Jersey that has done so much harm." She told me she had lived with her husband until she had a family of six children and that all were normal except the youngest child who was incorrigible and has since been killed by riding on a freight car on a railroad, much to the benefit of society. She said that she didn't know what was the matter with her husband, she knew nothing about defect when she married him. If he had been a drinker simply, she would have forgiven him, but he simply wouldn't work and he sat around and did nothing and she had to support him and the children and she decided that she would do better to leave him and support the children herself. I haven't been able to find him. I have traced him all over the country. He was for a time in a gypsy camp where he posed as the husband of the Gypsy Queen. There was a murder committed in the vicinity and they fixed it upon him. They finally found his wife in T—— and she said he didn't have enough mentality to commit a crime and he was cleared of it. After leaving the Gypsy camp he was married to a woman who was his first cousin and the shadow of the church spire fell upon the house where she was struggling along with her six children. The minister who married them was the only one who didn't know he was a married man. In less than two years he was living with another woman and she with another man and another minister married her in less than three years to a man up the country. That gives you just a little idea of how those people are living. Now going back of that, I found old people in the neighborhood who gave exactly the same story of the previous generation. One person told me about this great great grandfather that when she was a girl she used to be called to the window to see this old man. He went by the name of the old "Horror" and she described him—how on election day he came down with a new set of clothes and he was for anybody who would give him a drink. Another one told me this characteristic story. Of course his beverage was his best friend, and near-

ly every farmer had a barrel of cider on his porch. One old farmer used to take particular delight in entertaining the old fellow. He would let him drink as long as he wanted to, and on one occasion he drank until he toppled over and the old farmer chuckled and said, "I always knew them steps of mine did need fixing." The old fellow thought of course they were what had caused his fall. Stories of that kind told by people who are not telling them for any purpose, simply talking about old times and memories, certainly give a good picture of the mentality of these individuals, taken in conjunction with what we know of their descendants. Four of his children, Old Moll, Old Sow, Old Kate and Jane bear a description in the neighborhood that makes their classification certain with their children who are living today.

Dr. Fernald: We are glad that Miss Kite is not on our trail.

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EDITOR

A. C. ROGERS, M. D. - - - - Faribault, Minn.

ASSISTANT

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REVIEWS AND NOTICES

The Delinquent Child and the Home. SOPHONSBA P. BRECKINRIDGE, Ph. D., and EDITH ABBOTT, Ph. D., *Directors of the Department of Social Investigation, Chicago School of Civics and Philanthropy, with an Introduction by Julia Lathrop, Chief of the Federal Children's Bureau, New York. Charities Publication Committee, 1912.*

This book gives the results of an exhaustive study of juvenile delinquency in Cook County, Illinois. The juvenile court records furnished part of the data. This was supplemented by a more careful study of the homes and families of 584 boys admitted to the court during 1903, and of 361 girls of the State Training School. In these family studies the homes were visited, and all the information gathered that was possible by interviewing and observation. The analysis of these data is given in ten chapters, arranged and dis-

cussed from the standpoint of the conditions that lead to delinquency. The delinquent child is defined as the one who violates the law, is incorrigible, associates with vicious persons, grows up in idleness and crime or frequents disorderly gaming houses. Separate studies of the dependent or neglected child, and of truants, not attending school in accordance with the school attendance laws, are planned. The last 163 pages of the book are given over to six appendices on the following topics: "1. Legal problems involved in the establishment of the juvenile court. 2. Testimony of Judge Meritt W. Pinckney. 3. Abstract of juvenile court laws. 4. Family paragraphs relating to the delinquency of 100 boys. 5. Family paragraphs relating to the delinquency of 50 girls. 6. Copies of schedules used in the inquiry." The book is replete with statistical tables and concrete illustrations of the points and problems discussed. The two appendices on "family paragraphs," describing the conditions surrounding the delinquent child in the case of 100 boys and 50 girls are particularly instructive by way of giving concrete facts.

For 11,413 boys and 2,770 girls the ages at the time of their appearance in court shows that two-thirds of the delinquent boys are 12-15 years old, and 38 per cent. of the girls are 16-17 years. The percentage belonging to the different ages are as follows:

Age	7	8	9	10	11	12	13	14	15	16	17	18
Boys	.4	.9	3.2	6.3	9.6	13.0	14.6	18.6	22.0	9.6	0.2	0
Girls	.2	.5	.9	1.8	2.5	4.4	7.3	15.5	26.3	23.8	14.2	.5

The difference between boys and girls is explained as being in part due to the fact that in the case of the girls the offense so frequently takes the form of immorality—sex offense. Going to work makes the boy tend to "settle down" while for the girl it often means the beginning of temptation. Classifying the cases according to the nature of the offense gives the following percentages:

	Boys	Girls
Stealing	50.8	15.0
Incorrigibility	21.7	42.8
Disorderly Conduct	16.2	6.7
Malicious Mischief	6.5	0.2
Vagrancy	2.3	0.1
Immorality	1.6	31.4
Dependent Charges	0.8	3.3
Truancy	0.7	0.0
Miscellaneous Offenses	1.4	0.1
Not Given	0.0	0.4

Here it is seen that stealing far outranks the other offenses in frequency with the boys, while incorrigibility and immorality out-rank the others with girls.

The children of foreign parents are more frequently delinquent than are those of American parents. Chicago has over thirty-six different nationali-

ties, with a foreign born population of over 500,000, and over 700,000 born of foreign born. Of the married population,

- 18 per cent. are born of native white parents,
- 23 per cent. are native born of foreign parents,
- 57 per cent. are foreign born,
- 2 per cent. are colored.

The court records and also the more accurate data of the family studies show that the parents of delinquent children are more frequently foreign than the percentage of foreign parents in general alone would indicate. Of 392 fathers and 389 mothers of delinquent children in the family studies the following percentages indicate the facts:

	Fathers	Mothers
Native white	13.9	12.3
Native born of foreign born.....	7.7	11.8
Foreign born	67.1	66.6
Negro	4.3	4.0
Unknown	7.0	5.3

Ninety per cent. of the immigrants are fifteen years or over at the time they come to America. Sixty-four per cent. of the foreign fathers of delinquents and sixty-nine per cent. of the foreign mothers in the family studies are rural people, living in the country or small towns of Europe before emigrating. The authors, however, warn against the conclusion that the children of foreign parents are worse than the children of native born parents. American and European customs, standards of living, ideals of family life, and ideas of right and wrong often conflict. The Americanization of the foreign parent is often a slow process, especially in the case of the foreign born emigrating after he has grown up. The children are in a sense held to a double standard. They learn the American manners and customs in school, on the street, and in the factory, while European standards of life are strictly maintained by the parents in the home. The foreign parent also does not appreciate the dangers surrounding his child, or does not know how to protect him when he does know.

A close relation seems to exist between poverty in the home and delinquency of children. The families were divided into four classes on the basis of the amount of work done by the father, the standards of living, and the question as to whether the mother was a wage earner, as follows: 1. Very poor. 2. Poor. 3. Fairly comfortable circumstances. 4. Quite comfortable circumstances. The percentage of children whose parents came under these classes were distributed as follows:

	Boys	Girls
Group 1	38.2	68.8
Group 2.....	37.9	21.0
Group 3.....	21.2	7.6
Group 4.....	1.7	1.3
No home.....	1.0	1.3

These are results of 584 boys and 157 girls in the family studies. It appears that the girls are from poorer families than the boys, but it must be remembered that the girls were inmates of the Training School, and also that eighty per cent. of the girls' offenses was immorality. Early employment of the children to earn money is the main result of poverty ending in delinquency, especially in the case of girls and immorality. The causes of early employment are real need, ignorance of parents, degradation or avarice of parents. About one-fourth of the mothers of the boys were wage earners.

Orphanage and homelessness are the next factors in delinquency considered. The child may not be in the care of its parents through death of one or both parents, divorce, desertion, insanity, imprisonment, or failure to immigrate. Of 11,413 cases in the court records, thirty-one per cent. of the boys and forty-seven per cent. of the girls had lost one or both parents in one of these several ways. In the family study data these percentages were forty-three per cent. and seventy-seven for boys and girls respectively. The child may receive inadequate care because of an overcrowded home, step-parents, or early marriages. The family may be too large for each child to receive adequate attention, or the younger may be left in custody of the oldest. Remarriages of one or both parents may cause a mixed family of children as well as a large one. The youthful inexperience of young parents may lead to inadequate training of the child. In the family study data, fourteen per cent. of the boys and twenty-three per cent. of the girls had step-parents. Of 404 fathers and 430 mothers the following percentages show their age at the time of marriage.

	Fathers	Mothers
Under 16	0	5.6
16-17	1.7	14.4
18-19	1.7	20.2
20-24	41.8	46.1
25-29	33.9	10.2
30 and over.....	14.9	3.5

There is a considerable connection between school grade and attendance and delinquency. Seventy-two per cent. of the boys in the family studies were behind grade in their school work, calling the first grade normal for seven-year-old children. Seventy-three per cent. left school at the age of fourteen or earlier; the law requires attendance to fourteen years. One-fourth of the delinquent boys under fourteen were staying away from school. They leave school because the parents require their wages. Half the delinquent boys become so at the age of 14-16 years. Ninety per cent. of 705 delinquent girls were behind in their school grade. The homes of the delinquent boys were located on the city map. This shows that delinquency comes chiefly from the densely populated sections, the most conspicuous centers of delinquency being in a tenement and lodging house district between two branches of a river and between "wide and unsightly stretches of railroad tracks, and enclosed by a dense, semi-circular belt-line of manufacturing and commercial plants." Other

centers of delinquency are in the Italian quarters, and in the district of segregated vice. Only fifty-four per cent. of 832 boys were within half a mile of a park or playground.

The data so far given might lead one to suppose that children of the poor are more seriously delinquent than those of the well-to-do. But the authors conclude to the contrary that, "Bad children in good homes are for the most part disciplined at home or 'sent to school,' while bad children in poor homes get into the juvenile court." The bad boy is not always the product of poverty or misfortune. "It should be pointed out here, perhaps, in conclusion that in the preceding chapters no attempt has been made to charge up against the home or the community all of the offenses of the delinquent children of the court. It is only too obvious that when all the explaining is done, there remain a considerable number of bad boys who cannot be explained away."

This part of the book closes with a chapter on "Some aspects of the problem of treatment." The delinquent child is the neglected child, but the child is not the unit with which the court deals. It is the family. From the standpoint of treatment, families may be divided into several classes. 1. Families in which the conditions in the home are favorable and the parents understand the child's delinquency and are willing to co-operate with the court. 2. Families in which the conditions in the home or neighborhood make co-operation impossible, as in the case of the widowed or deserted mother going out to work. The ideals of the home may be good, but misfortune requires a sacrifice of the children. 3. Families in which the child is being sacrificed or exploited because his needs are not understood or are disregarded. 4. Families in comfortable homes and not outwardly degraded, but often with marital difficulties or "some diseased spot in the family life, affecting all the children." 5. Families in which there is drunkenness, immorality, crime, filth, and opposition to court aid. The authors conclude that "The most important lesson to be learned from any study of the juvenile court in its relation to the delinquent child is that the only way of curing delinquency is to prevent it. As the community comes to understand the obligation which rests upon it to abolish the causes of delinquency one may hope that new methods of conservation will be advised to take the place of the old waste of child life."

Faribault, Minnesota.

F. KUHLMANN.

NEWS AND NOTES

Professor E. G. Titus of the Utah Agricultural College and Agricultural Experiment Station, Logan, Utah, is conducting a course in eugenics at the Utah Agricultural College. Thirty-eight students were enrolled during the year. This is in addition to the class in Principles of Heredity and Evolution in which there are seventy-five enrolled. The permanent residence for

five generations of so many families in Utah affords a valuable field for study in heredity. There has also been organized in Utah a eugenics society of which Professor E. G. Titus is secretary.

Two new institution periodicals have appeared this year, The Colonist from Sonyea, N. Y., in January, and the Rome Custodial Herald, May 1st, 1913.

Such periodicals serve a useful purpose in keeping the parents and friends in touch with the institution life and they form the natural media for recording the important happenings of the institution community, and for giving expression to the literary endeavors of its population. Perhaps very few will have the opportunity to become like the Training School, a recognized medium for keeping the educational world in touch with advanced research work in the laboratories, but they have their mission independent of this.

We learn the following from the foreign correspondence of the Journal of the American Medical Association:

A bill has been introduced into the English parliament by the government for the purpose of establishing a Board of Commissioners to have control of all mentally defective persons. The board is to consist of twelve paid commissioners, at least one of whom must be a woman, and three unpaid commissioners, of whom one must be a woman. It is estimated that there will be, at least, 90,000 persons brought under the jurisdiction of this board.

A movement is on foot, promoted by the medical teachers, to search into the conditions on which mental deficiency depends and to seek the discovery of means by which, if possible, it can be prevented. This movement is indeed far-reaching and important, and we shall watch with much interest the results.

Michigan provides for an investigation of the extent of mental deficiency and the study of causes producing same.

The last legislature passed the following act which was approved May 2.

Sec. 1. There shall be a commission created to investigate the extent of feeble-mindedness, epilepsy, insanity and other conditions of mental defectiveness prevalent in the state of Michigan, and to make a study of the causes productive of these conditions.

Sec. 2. This commission shall be composed of the following members: The medical director of the state psychopathic hospital at the university of Michigan, the superintendent of public instruction, the secretary of the state board of corrections and charities. The medical director of the state psychopathic hospital is herewith made the executive officer of the commission.

Sec. 3. It shall be the duty of any and all officials in charge of any public, private, religious, charitable, penal or correctionary institution in whose custody are held individuals whose mental condition comes within the scope of investigation of this commission to furnish such information as may be desired by the commission, and to keep, during the existence of this commission, such records as it may prescribe.

Sec. 4. This commission shall present to the legislature of nineteen hundred fifteen a printed report embodying the results of its work, together with such recommendations for the treatment and prevention of these conditions as are suggested by their investigation.

Sec. 5. The commission is authorized to appoint such officials and employes as it may regard as necessary to carry on the purposes of this act, and such persons shall be paid such salaries as may be recommended by the commission and approved by the board of state auditors. These salaries and all expenses of the commission, after being duly certified by the chairman or some authorized member of the commission, shall be paid from the general fund of the state. The members of this commission shall receive no compensation for their services, but their actual and reasonable expenses incurred in the performance of their duties shall, after approval by the commission, be paid by the state treasurer on the warrant of the auditor-general, on the rendering

of their accounts, out of any moneys to the credit of the general fund not otherwise appropriated. The above payments to be made in accordance with the general accounting laws of the state.

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